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1997 Master Plan Update

Massachusetts Solid Waste Master Plan

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Volume I



Department of
Environmental Protection



Enclosed is the 1997 Update to the Massachusetts Solid Waste Master Plan - Executive Summary. Please be advised that the full copy (Volume I (text), Volume II (appendices)) of the 1997 Update to the Massachusetts Solid Waste Master Plan has been sent to the Chief Elected Official in your city or town.

The entire Update can also be downloaded from DEP's World Wide Web Site at:

<http://www.state.ma.us/dep>

Paper copies can be obtained by calling:

Ms. Donnette Matthews at DEP's Boston Office at 617-574-6844.
TDD phone (for the deaf) can call DEP at 617-574-6868 or 800-298-2207.

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MARGO PAUL CELLUCCI
Governor

TRUDY COXE
Secretary

DAVID B. STRUHS
Commissioner

December 23, 1997

Dear Citizen:

Enclosed is a copy of the 1997 Update to the Commonwealth's Solid Waste Master Plan.

We are excited that Massachusetts continues to make progress toward meeting its recycling goals. The recycling industry now employs nearly 12,000 people. At the same time that recycling has expanded, municipalities have made major investments to close and cap their old, unlined landfills. In large part, the Commonwealth has not had to replace these closing landfills with new landfills because of the expansion of recycling.

The 1997 Update enthusiastically reaffirms the Commonwealth's commitment to recycling and lays out the vision for how we will achieve our 46% recycling goal by the year 2000. This vision, called Goal 2000, is being supported this year by \$7 million from the Clean Environment Fund and will stress the continuation of core recycling programs such as recycling equipment grants; expansion of the Municipal Recycling Incentive Program; roll-out of a campaign to encourage greater participation in recycling programs; expansion of source reduction initiatives; strengthening enforcement of the recycling rules; and implementing the Commonwealth's plan for managing household hazardous materials.

The Commonwealth remains committed to the underlying Master Plan principle that our state should not become a net importer or exporter of solid waste. Our goal is to ensure that there is adequate, but not excess, waste management capacity in the state for the quantity of waste generated in the state.

Consistent with the projections in the 1995 Master Plan Update, there is no need for additional disposal capacity for municipal solid waste. As the plan predicted, there is a need, however, for additional capacity for construction debris in 1998 and 1999. This year's plan sets the stage for allocating that capacity. DEP has also begun planning now for new capacity anticipated to be needed in 2001.

Additional copies of the Executive Summary, Volume I (text), or Volume II (appendices) can be obtained via the World Wide Web at: <http://www.state.ma.us/dep> or by contacting Donnette Matthews at 617-574-6844, TDD phone (for the deaf) 617-574-6868 or 800-298-2207.

Sincerely,

Trudy Cox
Secretary

Executive Office of Environmental Affairs

David B. Struhs
Commissioner
Department of Environmental Protection

Chapter 1: Recycling in Massachusetts, 1997 and Beyond

Charting the Course for the Future

The 1990 Solid Waste Master Plan articulated the Commonwealth's hierarchy for managing solid waste and established the framework to achieve the Administration's goal of 46% waste diversion by the year 2000 (**Table 1-1**). Since publication of the 1990 Master Plan, the rate of recycling in the state increased quickly from 10% in 1990 to 31% in 1994. Since then, however, recycling in Massachusetts has plateaued, rising 1% annually to 33% in 1996. If the Commonwealth is to reach its 46% recycling goal, thereby further limiting its need for disposal capacity, it will be necessary to: expand the scope of existing recycling programs across the Commonwealth; establish new programs aimed at improving access and participation; and expand programs that create a demand for recyclables collected. While the 46% goal is an aggressive one that will require our utmost attention, we believe it is attainable.

TABLE 1-1: MASSACHUSETTS' COMPREHENSIVE WASTE PREVENTION STRATEGY

- Reduce both the volume and toxicity of all types of waste
- Divert as much waste as possible from the waste stream by promoting reuse and recycling of appropriate materials
- Dispose of unrecoverable solid waste in an environmentally sound manner

As we enter the seventh year of the original ten year plan, first laid out in the 1990 Master Plan, it is a good time to review the range of environmental and economic benefits that waste reduction, toxic reduction, recycling, and composting have provided, and recognize that the gains made in the first six years of the Plan will not be as easy to replicate in the last four years. The endeavor to reach 46% will require a sustained effort on the part of both public and private sectors if we are to continue to make progress.

EOEA and DEP have assessed the tools and tactics currently in place to achieve our goal and propose to modify and enhance them to ensure that progress will continue. This chapter presents a summary of why we should maximize recycling, how well we are achieving our current recycling goals, and how much more we have to do. It also describes the barriers to progress, and the tools we will use to get there.

Why Recycle More?

The benefits of recycling and waste reduction are many and varied, ranging from job creation, adding value to recycled materials, conserving resources such as timber, water and energy, and reducing the need to build disposal capacity in the form of landfills or combustion facilities. In most cases, recycling will also reduce waste management costs for municipalities and businesses.

Resource Protection and Conservation Benefits

Recycling presents numerous environmental benefits over disposal technologies; and several examples are summarized in **Table 1-2**. Recycling of paper, aluminum, glass and plastic conserves valuable natural resources, in particular, forests and non-renewable coal and oil

reserves. Recycling of steel and aluminum conserves energy and water as well as avoiding the environmental costs associated with mining scarce bauxite.

TABLE 1-2: ENVIRONMENTAL AND ECONOMIC BENEFITS OF RECYCLING

- For every 480,000 tons per year recycled or composted one 1500 ton per day landfill or waste to-energy facility does not need to be constructed
- It would take 4.5 additional landfills or combustion facilities disposing 1500 tons per day to handle the MSW recycled during 1996
- Recycling-based manufacturing reduces the need for activities like strip-mining and clear-cutting to acquire virgin raw materials
- Recycling of paper has added \$7.2 billion in value to recovered materials in ten northeastern states and employs 103,000 people
- Recycling aluminum cans saves 95% of the energy required to produce aluminum from ore.
- Each ton of recycled steel replaces the need to mine 1.5 tons of iron ore and 0.5 tons of coal
- At current steel recycling rates, the US saves enough energy to provide 18 million homes with electricity
- Recycling of 11 thousand tons of demolition debris resulting from a large fire has saved Malden Mills \$52,000 in costs for fill and \$1.3 million in avoided disposal costs

Recycling and composting also reduces our reliance on landfills, waste combustion facilities and the potential impacts of these facilities, some of which are outlined in **Table 1-3**. Reduced dependence on disposal technologies, in turn, reduces impacts to groundwater and air resources and, on a local level, reduces the impacts of odor and truck traffic.

TABLE 1-3: IMPACTS OF DISPOSAL

- Landfills contribute approximately 36% of the methane gas (a major contributor to global warming) generated in the US
- Each uncapped acre of a landfill can generate up to 631,000 gallons of leachate. This leachate either contaminates groundwater or must be properly managed in a wastewater treatment plant, which itself generates sludge which must be properly managed
- Solid waste combustion facilities are the largest source of mercury emissions in Massachusetts

Cost Savings and Benefits

In most municipalities, recycling is a **cost-effective** waste management tool because of the avoided disposal costs from the diversion of materials. In addition, the cost benefits increase as more materials are diverted from disposal to recycling, since each collection vehicle can collect more material per mile traveled. Both of these can result in dollars saved for cash-strapped municipalities. **Table 1-4** illustrates the cost savings that can occur as recycling rates increase in municipal programs. The table illustrates the fixed and variable solid waste and recycling costs

for these municipalities and how those costs change on a per ton basis with increasing recycling rates. While the rate at which combined solid waste and recycling costs decrease is different in each municipality, in each case, total costs decrease as recycling rates increase. Therefore, municipalities should invest in recycling to save money over the long term.

Municipalities can also save money on recycling by adding high-value materials such as textiles to their recycling programs. Municipalities may be able to earn as much as \$100 per ton of textiles collected, helping to offset waste management costs for other materials.

TABLE 1-4: SOLID WASTE AND RECYCLING COSTS AS A FUNCTION OF RECYCLING RATES IN THREE MASSACHUSETTS MUNICIPALITIES				
Recycling Rate		Solid Waste Cost \$/ton	Recycling Cost \$/ton	Combined Cost \$/ton
TOWN A				
current:	0%	\$52.75	\$0.00	\$52.75
	6%	\$54.43	\$64.91	\$55.06
	23%	\$57.07	\$27.63	\$52.96
	31%	\$62.09	\$14.87	\$49.72
	55%	\$67.04	\$11.07	\$47.34
TOWN B				
current:	0%	\$129.82	\$0.00	\$129.82
	19%	\$141.99	\$60.59	\$126.51
	23%	\$138.33	\$81.74	\$130.35
	31%	\$148.22	\$43.99	\$120.91
	55%	\$157.97	\$32.74	\$113.89
TOWN C				
current	0%	\$99.77	\$0.00	\$99.77
	20.5%	\$108.85	\$87.84	\$104.54
	23%	\$105.55	\$127.69	\$108.67
	31%	\$112.27	\$68.72	\$100.86
	55%	\$118.90	\$51.15	\$95.05

Economic Development Benefits

Recycling provides significant economic benefits by creating new jobs and adding value to waste materials. Based on its 1996 survey, the Chelsea Center for Recycling and Economic Development estimates that Massachusetts "scrap-based" manufacturers (companies that use recycled materials) currently employ nearly 12,000 people in Massachusetts, ranging from small companies to large-scale manufacturers. These manufacturers use at least 20 different recycled materials to manufacture a range of products. According to the Economic Policy Institute, for every 100 jobs in the manufacturing sector, an additional 422 jobs are created in distribution, sales, and transportation. Based on this relationship, recycled-based manufacturing in Massachusetts can be linked to an additional 50,000 jobs in the state. According to a 1995 EPA report entitled, "Manufacturing with Recyclables, 24 Case Studies," for every 15,000 tons of old newspaper collected for recycling, approximately 30 people are employed. An additional 10 jobs are created in processing the paper, and turning this paper into newsprint creates an additional 35 jobs at the paper mill.

Innovative businesses are being established in Massachusetts, including such companies as Malden Mills, where plastic bottles are recycled into clothing, and Global Recycling Technologies, which recycles fluorescent light bulbs and other mercury containing wastes. Companies such as Global not only recycle materials, but perhaps more importantly, help remove toxic materials such as mercury from our waste stream which, if disposed, would be released to the environment. At the same time, many small companies, including solid waste haulers, have found opportunities in recycling. In fact the number of recycling companies in DEP's Recycling Services Directory has more than doubled since 1988.

Waste Management Benefits

While the Commonwealth continues to import and export solid wastes across its borders without restrictions, the goal of planning for adequate in-state solid waste management capacity is central to the Solid Waste Master Plan. By planning for adequate capacity to handle the amount of waste generated in the Commonwealth, we can realize the benefits of recycling and composting, as well as assure that we will have sufficient disposal capacity to handle materials not readily recycled or composted. Furthermore, recycling capacity has increased while disposal prices have remained relatively flat over the last five years, even as landfills have been closing. This situation benefits both municipalities and businesses to keep disposal costs down. Recycling, processing and composting facilities will continue to fulfill a significant part of the state's need for capacity to handle MSW, and with combustion facilities and landfills, will provide Massachusetts with a truly integrated solid waste management system.

Where Are We Now?

Massachusetts has made impressive strides to promote recycling and composting, increasing the diversion of MSW from 10% in 1990 to 33% in 1996. Over this time period, Massachusetts has diverted over 6.6 million tons of MSW from disposal to recycling. At the current recycling rate of 2.4 million tons in 1996, we forego the need to build nearly 5 landfills or combustion facilities handling 1500 tons per day of MSW. Processing of construction and demolition debris diverted nearly 8 million tons of material from disposal. At the same time, the Commonwealth has worked with municipalities and private operators to close 117 unlined landfills since 1990 (see Chapters 2 and 3).

Status of Municipal Recycling Programs

Success in waste diversion has been achieved largely by expanding access to recycling programs for the citizens of the Commonwealth. Many municipalities now have comprehensive recycling programs, as attested to by the number of communities whose Recycling Report Card grades have improved (**Table 1-5**). Massachusetts now stands as one of the leading states in the nation with regard to the percentage of MSW recycled by its citizens. Recycling has now become a regular activity for many people living in Massachusetts.

While municipalities are continuing to improve their recycling programs, the 1997 Recycling Report Card delivered mixed news. The report card showed that while 101 communities received higher grades, 207 remained the same and 43 municipalities saw their grades drop. For many of these municipalities, the lower was

TABLE 1-5: COMPARISON OF 1995, 1996 AND 1997 RECYCLING REPORT CARDS

Grade	1995	1996	1997
A	61	124	156
B	76	106	108
C	122	79	60
D	22	19	16
I/F*	70	23	11
Total	351	351	351

* I = incomplete data, counted as F

the result of communities dropping the collection of one or more recyclable materials due to the relaxation of the paper recycling markets from 1995.

Over the past several years, progressive municipalities have expanded recycling access by collecting more types of materials; changing from drop-off to curbside collection; and expanding to collect large volume hazardous household products such as paint and oil. They have also increased recycling participation, by developing unit-based pricing programs for solid waste management; providing new outreach services such as block captains and public school outreach; and by providing more and better public information. Progress may be seen in the number of municipalities that have adopted curbside collection programs. In 1990, only 18 of the 50 largest municipalities in Massachusetts had some form of recycling program and only two of those were curbside collection programs. By 1996, 44 of the 50 municipalities had established curbside recycling programs. Another indicator is the number of municipalities that received an A or a B (recycled more than 20% MSW) on the Recycling Report Card. This number has increased from 137 in 1995 to 264 in 1997.

Where Do We Need To Go?

As impressive as the progress made to date is, there is still a long way to go to reach the 46% recycling goal. Recycling efforts clearly need to be redoubled to get from 33% in 1996 to 46% by the year 2000. Are the recyclable materials there? Can we capture them? We firmly believe the answers to both questions are "yes."

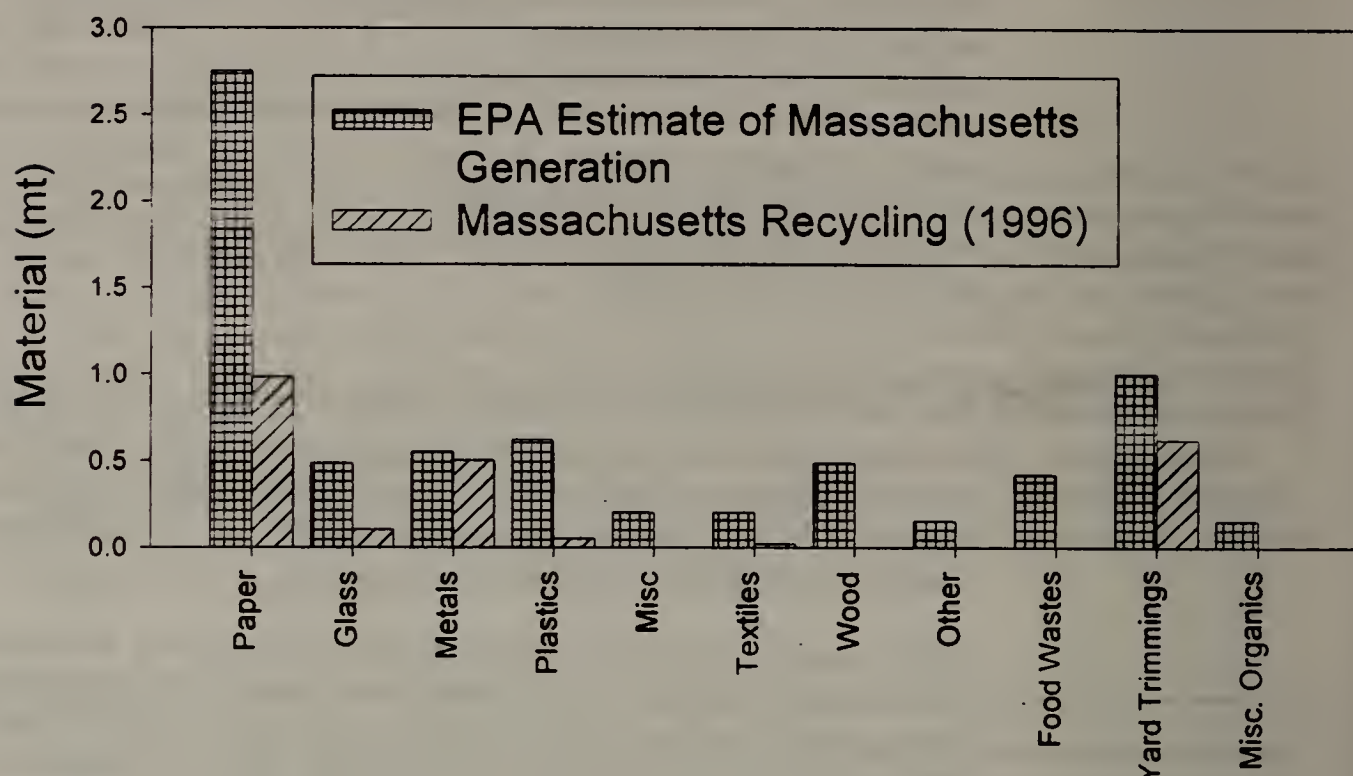
While access to residential recycling programs has improved dramatically over the past six years (85% of Massachusetts citizens currently have convenient access to collection programs), that still leaves nearly 1 million residents without such access. Many of these residents receive private service, through their apartment or condominium hauler, or through a private curbside collector in their drop-off community. Even more importantly, dramatic improvement in participation rates is needed in communities which have existing programs if we are to attain our goal. In short, municipalities need to ensure that their recycling and composting programs work, and work well. EOEa and DEP remain committed to assisting municipalities by providing recycling equipment, public information materials, and technical assistance. But, in the end, municipalities are responsible for ensuring that their programs work well and reach all citizens. In addition, the Commonwealth must continue efforts to encourage businesses to recycle, help pave the way for new recycling businesses, and be a good example in purchasing recycled content materials.

The 1990 Master Plan analyzed the composition of the waste stream, adopted reasonable assumptions about rates of participation and capture of materials and projected the amounts of material that could reasonably be diverted from disposal. (see **Table 4-b**, page 36 of the 1990 Plan). Based on this information DEP determined that 46% of solid waste could be recycled or composted. Do these same assumptions continue to hold true in 1997 as in 1990? Is there enough uncollected glass, metal, plastic, paper, textiles, leaves and yard waste remaining in MSW to expect that we can meet the 46% goal? The answers are "yes."

Figure 1-1 provides a comparison of the generation of various waste materials, based on EPA's most recent 1996 analysis of the generation of MSW, versus how much of those materials were recycled in Massachusetts in 1996. Clearly, abundant quantities of paper and paperboard remain uncollected, along with plentiful quantities of glass, plastics, wood and food wastes. To move from the current 33% recycling rate to 46% we will have to collect an additional 1 million tons of recyclables. The figure also indicates that within the paper and paperboard category alone, over 1.5 million tons remain to be collected in Massachusetts. Given that other materials such as glass, plastics and food wastes will also be collected, it is clear that sufficient recyclable materials remain in the waste stream and that the 46% goal remains an achievable one.

Finally the Figure illustrates great success in the diversion of composted materials such as leaves and yard waste and metals.

Figure 1-1 Waste Generation and Recycling for a Variety of MSW



The Barriers to Progress

The key barriers to achieving the recycling goal have remained much the same. Over the past few years, these include market uncertainty due to the relaxation of the paper recycling markets, lack of full participation in recycling programs, and insufficient purchase of recycled products. (see **Table 1-6**). EOE and DEP believe that the best way for government to address these barriers is to improve access and participation and to accelerate the purchase of recycled-content products by the state, municipalities, and businesses. We have a number of programs which attempt to manage these barriers, and they are summarized in the second column of the table.

TABLE 1-6: 1997 BARRIERS TO RECYCLING AND PROGRAMS TO ADDRESS BARRIERS

Barrier	Program to Address Barrier
<ul style="list-style-type: none"> Market uncertainty 	<ul style="list-style-type: none"> Recycling Business Loan Fund Springfield MRF guaranteed floor price for recyclables Recycling Industry Reimbursement Credit Recycling Markets Strategic Plan

1997 BARRIERS TO RECYCLING AND PROGRAMS TO ADDRESS BARRIERS (CON'T)	
<ul style="list-style-type: none"> Lack of full participation in recycling programs 	<ul style="list-style-type: none"> Recycling Participation Campaign WasteCap business recycling programs MRIP requirements Unit based pricing grants Recycling contract templates with hauler incentives
<ul style="list-style-type: none"> Private haulers not providing recycling services to clients 	<ul style="list-style-type: none"> Expand MRIP and DARP requirements, or Mandatory recycling legislation on hauler
<ul style="list-style-type: none"> Insufficient purchases of recycled products 	<ul style="list-style-type: none"> Operational Services Division (OSD) recycled purchasing program Buy Recycled Business Alliance Condition to develop recycled product purchasing program in Municipal Grants MRIP requirements Recycling Participation Campaign
<ul style="list-style-type: none"> High transportation costs 	<ul style="list-style-type: none"> Regional recycling transfer stations Equipment grants - transfer trailers or recycling drop-off sites and transfer stations
<ul style="list-style-type: none"> Insufficient public education 	<ul style="list-style-type: none"> Recycling Education Assistance for Public Schools (REAPS) program Consumer education grants Recycling Participation Campaign
<ul style="list-style-type: none"> Poor regional cooperation 	<ul style="list-style-type: none"> Technical assistance grants for regional groups
<ul style="list-style-type: none"> "Put or pay" contracts that discourage recycling 	<ul style="list-style-type: none"> Municipal Recycling Incentive Program (MRIP) Unit-based pricing grants
<ul style="list-style-type: none"> Excess capacity at unlined landfills 	<ul style="list-style-type: none"> Closure of all unlined landfills by 2000 Recycling transfer station grants
<ul style="list-style-type: none"> Lack of trained people and new technologies 	<ul style="list-style-type: none"> Recycling intern program University research

Recycling Market Dynamics

Table 1-7 provides insight into why markets continue to be a barrier to increased recycling. For some recyclables, in particular paper, large market fluctuations create barriers to recycling. In the second half of 1995, the prices for recyclables, particularly paper, were extremely high and favored municipalities and businesses selling recyclable materials. At the same time, these prices were unsustainable for many paper mills. Following this period, prices dropped, and now favor mills that buy recycled materials. While most of the problem with markets is due to prices for newspaper and mixed paper, other recyclables, such as plastics were also affected. Recent market reports indicate an upswing in values for several recyclables including plastics, white goods, metals, and old corrugated containers.

In spite of these price disruptions, most recyclers and municipalities continued to recycle because the economic value of recycling remains strong. Those with the foresight to sign long-term

contracts with end-users have been rewarded. The effects of price fluctuation have been on the price of recyclables, not on the ability of our mills to consume the material. The market need is strong for recycled material as Massachusetts industry must import significant quantities of recyclable paper, glass, and plastic to produce goods to meet current orders.

Volatility in the recyclables markets has called into question whether the state's aggressive recycling goal can be met by 2000. Even with market fluctuations, the Commonwealth believes that 46% is an achievable goal, and reaffirms its commitment to meeting that goal by 2000.

The pessimistic reaction to market fluctuations tends to ignore fundamental realities. First, it ignores the long-term benefits and cost savings of resource conservation, extended landfill capacity, long-term municipal cost savings, and economic development, which are not reflected in the day-to-day swings of the commodities markets. Second, while high prices create unexpected revenue for municipal programs some local paper mills were unable to sustain purchases of secondary materials. For recycling to be sustainable, government and industry need to communicate a long term commitment to residents. For recycling businesses to take hold, they must know that municipalities and processors are going to continue to collect recyclables even when there are temporary downturns in the markets.

Recent research and program planning conducted for DEP and the City of Boston recommend that Boston and other municipalities make arrangements with contractors to share the revenue and risk from marketing recyclables, thereby reducing risk for both contractors and municipalities and smoothing out market fluctuations. Such an approach can help make municipal programs more cost-effective and sustainable. This research also recommends that municipalities may want to base a recycling contractor's payment on the number of tons they collect for recycling, thereby also giving contractors a stake in the success of recycling. DEP will soon be make recommendations from this research available to municipalities in the form of a draft contract template.

TABLE 1-7: FACTORS THAT IMPACTED PAPER PRICES

- The slow down in the U.S. and global economies caused mills to reduce material utilization rates in late 1995, which translated into less demand for waste paper in domestic and export markets. Even with the slow down, some mills built up wastepaper inventories in anticipation of increasingly tight markets and high prices.
- Increased waste paper recovery was due to a robust paper demand in 1994 and the first quarter 1995. Although the demand for waste paper slowed, the investment in new collection infrastructure provided more materials to be supplied to the recycling markets.
- Hedging and bluffing by domestic and overseas buyers and sellers also influenced paper prices. Buyers purposefully delayed orders to drive prices down. They also may have exaggerated their inventory levels.

* Industry Analyst Michael Alexander - Excerpted from WasteCap Newsletter, Summer, 1996

Other Barriers to Recycling

EOEA and DEP have targeted several of the other barriers to recycling and are addressing them through existing solid waste management programs. For example, excess capacity at unlined landfills is being eliminated through closure of the remaining unlined municipal landfills. High transportation costs for recyclables is being addressed through grants for transfer trailers and recycling transfer stations. Poor regional cooperation is being addressed through technical assistance grants to regional groups to promote regional recycling solutions. Finally, insufficient public education is being addressed through the Recycling Education Assistance for Public Schools (REAPs) program, through public education grants, and the Recycling Participation Campaign. Clearly, measurable progress has been made in breaking down these barriers, but continued efforts will be required if we are to reach the 46% goal.

Tools To Improve Recycling

Introduction: Focus on Access and Participation

Barriers play a role in restraining the expansion of recycling. Removing the obstacles of inadequate access to recycling services and insufficient participation in available programs will provide a boost to the recycling rate.

Inadequate access to recycling falls into three categories: (1) no access because the private waste hauler does not offer recycling services or the apartment or condominium does not contract for those services; (2) inconvenient access because the services provided for recycling collection are less convenient than the trash collection service (for example, curbside trash collection and drop off recycling); and (3) insufficient access because the recycling service does not provide for collection of all the materials that can be reasonably recycled, (e.g. paperboard and all types of plastics).

Providing more access to residents and businesses will not by itself expand recycling to reach the statewide goal. As the recycling report card shows, many communities with adequate access have disappointing recycling rates. Poor participation may be addressed through more active program management by local officials, or improved communication about a program (what to collect, when the program collects materials, and where the collection takes place, if not curbside) in order to improve motivation for current and potential participants. Even communities with good participation can continue to improve motivation of current and potential recyclers.

Source Reduction Initiatives

The waste management hierarchy has promoted source reduction for the past five years and has relied upon three programs:

- funding the compost bin grant program
- the unit-pricing program to reduce the amount of residential waste in the waste stream
- funding WasteCap to promote source reduction and recycling in Massachusetts' business and industry.

Even with these source reduction programs in place, it has become clear that Massachusetts' strong economy continues to increase the amount of MSW generated (see Chapters 3 and 4). To

counter this increase in generation, DEP and EOEa will place a greater emphasis on source reduction initiatives over the next few years with the goal of reducing future growth in MSW generation. Through research and discussions with other states, DEP is developing a realistic and appropriate source reduction program to provide a framework on which to evaluate the success of individual activities. EOEa's and DEP's proposed source reduction initiatives are listed in **Table 1-8.**

TABLE 1-8: SOURCE REDUCTION INITIATIVES: GENERATING LESS WASTE			
OBJECTIVES	ACTION	POSITIVE IMPACT	TIMING
EXPAND NUMBER OF UNIT-BASED PRICING PROGRAMS	Bag and Sticker grants Equipment grant matching fund waiver Extra public education materials	Reduce entry costs for Unit-based pricing	Ongoing
	MRIP incentive grants: eligibility for grant and grant bonus	Create financial incentives to initiate UP programs	FY 98 MRIP
	EOEA/DEP guidance document for municipalities \$30,000 federal grant for outreach and education Recycling Participation Campaign	Expand access to educational materials and forums for public officials	1997
	Increased Boston and regional staff outreach and coordination	Expand hands on technical assistance to public officials	1997
SUPPORT BUSINESS EFFORTS ON SOURCE REDUCTION	Provide financial and technical assistance to WasteCap Re-focus Governor's Packaging Award	Reduce commercial waste generation	Ongoing FY 98/99
REDUCE VOLUME OF PACKAGING IN WASTE STREAM	Public support of legislation on packaging reduction and labeling	Provide leadership on reducing major source of waste	Ongoing
EXPAND HOME COMPOSTING	Continue compost bin grants	Reduce entry costs for home composting	Ongoing
	Expand "Master Composter" and other training seminars	Increase education and technical assistance for home composting	Ongoing
EXPAND INSTITUTIONAL COMPOSTING	Initiate MA. Correctional Facility compost program UMASS/STEP compost technology pilot	Reduce waste from state and county prisons Reduce cafeteria waste disposal	1997
EXPAND SOURCE REDUCTION PROGRAM OPPORTUNITIES	Survey successful programs in other states Review feasibility of Clean State pilot programs Convene industry forum to stimulate ideas and plans for packaging reduction initiatives	Expand program	1997-98
REDUCE TOXICS IN THE WASTE STREAM	Legislation on product stewardship for batteries and fluorescent lamps HHP Plan Implementation Oil and paint grants	Reduce emissions from disposal facilities	Ongoing

While all state agencies lack strong authority to regulate source reduction, industry hazardous waste reduction and in-house recycling programs have documented strong cost savings, and there is a potential to use cost reduction as the basis of incentives and technical assistance for solid waste source reduction.

Like recycling, source reduction involves Purchasing and Production Managers in businesses and industries as well as consumers and employee participants. A review of several states and national source reduction programs has revealed three main areas of promotion of source reduction practices.

1. Reduced material use in one-use items (e.g. paper towels and packaging)
2. Increased material use for durable items (replacing disposable shipping containers, and one-use items), and
3. "Source-demand" or "waste elimination" programs (e.g. reusing by-products in house, and home composting).

Some states also incorporate other programs under the source reduction umbrella, such as commercial recycling. The easiest programs to promote have been those that require a one-time replacement purchase or are commercial scale, equipment or process changes (e.g. a magnetic tape back-up device to replace computer-generated hard-copy printers). The least successful programs have been those that require millions of individuals to make conscious behavioral changes, such as double-sided copying or rewashing a personal mug. For most of these programs, there is a "critical mass" of use required to "break even" on a waste reduction (and cost reduction) basis - for example, replacing old copy machines or printers that have not yet served their useful life requires that enough consumers use the double-sided copying feature. All mandated programs must be well thought out to accommodate application issues.

EOEA and DEP are currently researching other state and national source reduction programs in order to emulate those programs and research their systems for accountability. In addition, individual source reduction projects, based on other state or federal programs, continue to grow. EOEA and DEP will hire a consultant to set up source reduction and recycling programs in different public/state buildings, and determine the feasibility of establishing waste reduction goals for state agencies and municipalities. In fact, in August 1997, Massachusetts became the first state to join the EPA Waste Wise program. Through this voluntary program, the state will establish goals for its own agencies for waste reduction, recycling and buying recycled. And through "WasteCap," DEP is collecting case studies of commercial source reduction techniques that can be carried out in other businesses.

Goal 2000 Recycling Strategy

To achieve the Commonwealth's 46% recycling goal by the year 2000, EOEA and DEP propose the following Goal 2000 Recycling Plan. This Plan provides a road map for the next three years. The Plan is divided into two sections -- a Recycling Collection Plan and a Recycling Market Development Plan. The sections include a mix of new programs and continuation or expansion of existing programs. The Recycling Collection Plan section focuses on collecting recyclables, or the *supply side* of recycling, while the Recycling Market Development plan section focuses on processing recyclables, and manufacturing and purchasing products made from recyclables, or the *demand side*. Although market development does not show up directly in the recycling rate, it is needed to effectively and sustainably increase recycling in the Commonwealth.

TABLE 1-9: GOAL 2000 RECYCLING COLLECTION PLAN INITIATIVES

(Initiatives are divided into those that will increase access and those that will increase participation and are ranked in order of significance below.)

PROGRAMS TO INCREASE ACCESS

Increase recycling rate by 3 to 4 percentage points

CORE GRANTS (Equipment and Technical Assistance): Continuation of grants for essential recycling equipment and technical assistance to provide a basic level of recycling services.

MUNICIPAL RECYCLING INCENTIVE PROGRAM (Access Conditions): Performance based grants to municipalities that meet a set of eligibility criteria, including criteria designed to improve access. Qualifying municipalities will receive an incentive payment or "bounty" for each ton of designated recyclables diverted.

RECYCLING RULES: Strengthen enforcement of the waste ban regulations at facilities. Upgrade the eligibility requirements for Department Approved Recycling Programs. Propose legislation to ensure that all households are offered equivalent levels of recycling and disposal service, helping to reach 100 percent access to recycling.

MODERATE EXPANSION OF BOTTLE BILL: Expansion of bottle bill to cover single-serve containers of juice, iced tea, water, and sports drinks.

PROGRAMS TO INCREASE PARTICIPATION

Increase recycling rate by 9 to 10 percentage points

MUNICIPAL RECYCLING INCENTIVE PROGRAM (Participation Conditions): Performance based grants to municipalities that meet a set of eligibility criteria, including criteria designed to increase participation. Qualifying municipalities will receive an incentive payment or "bounty" for each ton of designated recyclables diverted. Criteria reflect a strong preference for unit-based pricing.

CORE GRANTS (Unit-based pricing and Consumer Education): Grants to cover unit-based pricing bags or stickers and start-up costs and public education materials.

RECYCLING PARTICIPATION CAMPAIGN: A multi-media public information campaign designed to motivate non-recyclers to change their behavior in their homes and offices.

The Recycling Collection Plan section focuses on two primary areas (see **Table 1-9**). First, it includes a strategy to achieve convenient access to recycling programs for all citizens and businesses of the Commonwealth. Second, it will boost participation rates in established recycling programs to the achievable levels. Key milestones of the Recycling Collection Plan include:

- 98% of residents will have convenient access to recycling of all basic recyclable materials by 2000,
- 90% of residents will have access to household hazardous waste services by 2005,
- 75% of employees will have access to commercial recycling by 2000,
- 70% of residents will have access to residential recycling by 2000.
- 40% or 140 municipalities will have unit-based pricing programs in place by 2000,
- 90% of residents will have access to hazardous household products collections by 2005,

- 90% of employees have to access in commercial recycling by 2000,
- All municipal recycling programs will divert a minimum of 20% of the waste generated within the municipality by 2000,
- By 2000 new materials, such as textiles, will be recycled by 75% of municipalities.

Another important strategy for reaching 46 % recycling by the year 2000 will be unit-based pricing programs. EOEa and DEP will encourage and motivate municipalities to initiate unit-based pricing programs to the maximum extent practicable. Unit-based pricing, or “pay as you throw” or “pay per bag”, means that residents pay for solid waste management services on the basis of how much waste they discard, rather than through a fixed fee or property tax. Municipalities with unit-based pricing save money through lower disposal costs and increased recycling revenues. Residents have a direct financial incentive to throw away less, and recycle and compost more. The state’s promotion of unit-based pricing will include:

- Establish unit-based pricing as the most aggressive criterion of the MRIP Program-municipalities must either meet performance-based recycling goals, have a unit-based pricing program or adopt a range of other initiatives to be eligible for a recycling incentive payment,
- Increase maximum unit-based pricing materials grant amounts from \$2/household to \$10/household for bags or stickers to increase the incentive to start new unit-based pricing programs,
- Provide additional “bonus” grants to municipalities adopting new unit-based pricing program by waiving the matching grant requirements for replacement bins and recycling trucks.
- Provide automatic grants of public education and outreach materials to communities adopting unit-based pricing,
- Distribute EOEa/DEP Guidebook, *Pay As You Throw: An Implementation Guide for Solid Waste Unit-Based Pricing Programs*,
- Provide technical assistance and program planning to municipalities, including workshops, one-on-one meetings, and discussions with “mentors,”
- Hold statewide forums through satellite connections,
- Speak on unit-based pricing and distribute information at major conferences.

Seventy-five Massachusetts municipalities have begun unit-based pricing programs. More than 75 % received an “A” on the 1997 Recycling Report Card, which reflects much higher recycling rates than the statewide results (in which less than 50 % of municipalities received an “A”). If the largest municipalities in the Commonwealth, representing over 50 % of the state’s population, all implemented unit-based pricing, the statewide recycling rate would jump four percentage points from 33 % to nearly 37%. If all 351 municipalities adopted unit-based pricing, the statewide recycling rate could grow by a total of six percentage points, to 39%.

Core Recycling Programs

By offering the basic recycling equipment and supplies necessary to establish programs, Municipal Equipment Grants are designed to meet the “core needs” of increasing recycling access and participation for municipalities. Over the past seven years, EOEa and DEP have provided core recycling grants for recycling trucks, set-out bins, consumer education materials, compost bins, roll-off containers, technical assistance, and surplus paint storage and used oil storage equipment. These grants have succeeded in enabling many municipalities to start up recycling

programs where none previously existed and to expand programs that had been in place. The core grants program has been responsible for increasing diversion from approximately 10% in 1990 to 33% in 1996.

An analysis of several municipalities which operate successful programs versus those that operate subpar programs confirms a positive correlation between grants received by the municipality on a per capita basis and higher recycling rates. Successful programs have received between \$1.71 - \$8.32 per capita, while subpar programs have received only \$0.24 - \$1.09 per capita. The equipment grants program clearly has played a major role in helping to "jump-start" recycling programs or provided the means to improve existing programs. EOEA and DEP intend to continue this effort, focusing on moving all municipalities to a recycling rate of at least 20% (without composting) by meeting the needs for basic recycling equipment.

The core recycling grants will also be used to promote unit-based pricing programs, including municipal assistance. Municipalities interested in starting unit-based pricing programs in their communities can receive grants for program start-up costs (up to \$10 per household), including funding for bags or stickers. In addition, municipalities with unit-based pricing programs can also receive free public education materials. Communities implementing new unit-based pricing programs would also be eligible to receive curbside recycling trucks and bins without paying the matching share that other communities must contribute.

EOEA and DEP have also developed a unit-based pricing guidebook, "Pay As You Throw: An Implementation Guide for Solid Waste Unit-Based Pricing Programs," which provides guidance for municipal decision-makers and citizens on how to develop and implement successful unit-based pricing programs in their communities. DEP staff have conducted extensive technical assistance and program outreach efforts to promote unit-based pricing and assist municipal officials with developing programs in their communities. These efforts include making presentations at major conferences, holding municipal workshops, and meeting with individual municipalities. These initiatives will continue on an ongoing basis and be paired with financial incentives to further encourage the use of unit-based pricing throughout the Commonwealth.

The recycling equipment grant program is also a flexible program. It can be tailored to meet the shifting equipment needs of municipalities and policy goals of the Commonwealth. As municipalities have successfully developed recycling programs, they have been able to consider expansion of their programs by going to a curbside program or instituting collection and recycling programs for HHP. For example, many municipalities have expressed interest in collection of used motor oil and left-over paint. To respond, EOEA/DEP is in the fourth year of providing grants for waste oil collection tanks and paint collection sheds and cabinets. Furthermore, the Commonwealth may attach conditions to grant agreements to further policy goals. For example, equipment grants now require municipalities to establish a buy recycled purchasing policy. In general, the equipment grants program will continue to play a major role in providing recycling equipment to municipalities that need to develop new or modified programs, or expand existing programs.

Well managed recycling programs should be capable of recycling at least 20% of residential MSW. The 1997 Recycling Report Card indicates that 87 municipalities operate recycling programs that do not yet divert 20% of their MSW to recycling (grade of C or below), although several are very close to this percentage. It is these communities that EOEA/DEP must partner with to improve existing programs or develop new programs. Some of these municipalities have already received recycling equipment grants and DEP is working with them to make their programs more effective. In others: better communication is needed about how the grant program works; better information is needed about what wastes can be recycled; more recycling is still needed to help establish good programs or to make the switch from drop-off to curbside collection. DEP regional recycling staff will work with the lowest performing communities to

develop realistic plans aimed to increase their recycling diversion and show how the programs can be cost effective.

Municipal Recycling Incentive Program

The Municipal Recycling Incentive Program (MRIP) will provide performance-based grants to municipalities, statewide that are designed to increase access and participation in recycling programs and to stimulate the demand for recycled products. Qualifying municipalities will receive an incentive payment for each ton of designated recyclables diverted within a specified period. The MRIP is based on the successful three year pilot program for the 23 communities in the North East Solid Waste Committee (NESWC). The FY97 program conditions include: obtaining Department Approved Recycling Program (DARP) and Department Approved Composting Program (DACP) status; making a commitment to Buy Recycled; implementing curbside recycling if they provide curbside trash collection; and participating in a regional collection program for hazardous household products and other program initiatives. Fifteen municipalities that participated through the first two years of the NESWC program demonstrated a 16% increase in the amount of materials diverted through recycling programs.

The statewide MRIP program uses lessons learned from the NESWC pilot. Municipalities will be required to meet a set of criteria or performance standards to be eligible for the program. Municipalities that meet these requirements would receive a per ton incentive payment for each ton of designated materials they recycle, with a cap on total annual payments per municipality. As part of MRIP, two rates of incentive payments will be offered: an \$8 per ton rate for municipalities with curbside recycling programs and a \$4 per ton rate for municipalities with less expensive drop-off recycling programs. Eligibility criteria increase in subsequent years of the program and municipalities will be required to make greater investments in recycling programs or buy-recycled efforts to receive incentive payments.

For example, the MRIP eligibility criteria will increase every six months. In the first year of MRIP, municipalities must meet minimum requirements including DARP/DACP status, adoption of a buy-recycled purchasing preference, and "parallel access" between recycling and trash collection. In addition to the basic first year criteria, they will also be required to implement several other initiatives from three categories: Access, Participation, and Buy Recycled. These categories will offer municipalities some flexibility in choosing which program initiatives they will meet to qualify for MRIP incentive payments (see **Tables 1-12 and 1-13**).

While the first year MRIP criteria have been set, DEP and EOEA expect to learn a lot during the first year of this new approach and grant program. While future years are being planned to allow municipalities to anticipate which programs must be developed, there will be annual consideration of the next year's MRIP criteria. These changes will respond to feedback from municipal and environmental representatives.

TABLE 1-12: MRIP ELIGIBILITY CRITERIA (JULY-DECEMBER, 1997)

Municipalities must meet the following criteria by December 1, 1997 to qualify for MRIP payments for first six months of FY98.

1. DARP or DACP status and;
2. a Buy Recycled Purchasing Policy and;
3. a Unit-based pricing Program or the specified number of criteria from the Access and Participation menus below:

Participation (must comply with 1 below)	Access (must comply with 1 below)
<ul style="list-style-type: none"> • 2 town-wide recycling education mailings/year • Recycling participation "lottery" • Direct marketing campaign • Block leader program • Bi-lingual recycling outreach • Participate in Massachusetts Recycles Day 	<ul style="list-style-type: none"> • Parallel access • Commercial recycling program • Mandatory recycling ordinance on independent haulers • Recycling at all public schools • Multi-family recycling program Collection of 3 types paper, all plastics • Ordinance banning collection of yard waste w/MSW • Textiles collection program • Permanent collection site(s) for 3 or more HHP items

TABLE 1-13: MRIP ELIGIBILITY CRITERIA (JANUARY-JUNE, 1998)

Municipalities must meet the following criteria by June 1, 1998 to qualify for MRIP payments for the second six months of FY98.

1. DARP and DACP status and;
2. Buy Recycled Purchasing Policy and;
3. Parallel Access between trash and recycling collection and;
4. Tracking System to Report all Municipal Recycling Purchases and;
5. Must meet the specified number of criteria from each of the three categories below. Municipalities with unit-pricing programs are only required to meet the Buy Recycled criteria specified below

Participation (comply with 2 below)	Access (comply with 2 below)	Buy Recycled (comply with 1 below)
<ul style="list-style-type: none"> • 2 town-wide recycling education mailings/year • Recycling participation "lottery" • Direct marketing campaign • Block leader program • Bi-lingual recycling outreach • Participate in Massachusetts Recycles Day 	<ul style="list-style-type: none"> • Mandatory recycling ordinance on independent haulers • Commercial recycling program • Recycling at all public schools • Multi-family recycling program • Collection of 3 types paper, all plastics • Textiles collection program • Ordinance banning collection of yard waste w/MSW • Permanent collection site(s) for 3 or more HHP items 	<ul style="list-style-type: none"> • Testing and evaluation of 2 recycled products • Adoption of federal recycled paper standard • Attendance of 3 municipal representatives at Buy Recycled Vendor Conference

In subsequent years of MRIP, EOEa and DEP propose that communities continue to meet all of the first year requirements, while also implementing additional initiatives, such as: adoption of a mandatory recycling ordinance on trash haulers (requiring haulers to *offer* recycling services to each solid waste client), an ordinance banning collection of yard waste with MSW, and permanent collection of certain hazardous household products. The MRIP will be flexible in eligibility criteria which address specific barriers to recycling and can be modified from year to year. By

meeting certain requirements under MRIP now, municipalities can also ensure that they will meet new DARP standards that will be enacted on December 31, 1998.

MRIP will reward municipalities that develop and implement programs effective at increasing recycling rates and especially those municipalities with unit-based pricing programs for solid waste. Unit-based pricing, though optional, is considered to be the most important strategy for increasing recycling participation because it provides a direct financial incentive for residents to divert materials from their trash cans to their recycling bins. In unit-based pricing programs, recycling is free, while each unit of trash disposal has a cost. This direct economic incentive is more effective at increasing recycling participation than indirect incentives. To emphasize the importance of unit-pricing, MRIP will exempt municipalities with unit-pricing programs from meeting the access and participation options discussed above. As currently proposed, municipalities that reach a 35% recycling goal by year three will also receive this exemption. These municipalities will still be required to meet certain minimum requirements for recycling, buying recycled or toxics reduction that we feel are particularly important even if they have reached a high recycling rate.

**TABLE 1-14A: PROPOSED MRIP ELIGIBILITY CRITERIA: YEAR TWO
JULY-DECEMBER, 1998**

Municipalities will be asked to meet the following criteria by December 1, 1998 to qualify for MRIP payments for the first six months of FY99.

1. DARP and DACP status *and*;
2. Buy Recycled Purchasing Policy *and*;
3. Parallel Access between trash and recycling collection *and*;
4. Tracking System to Report all Municipal Recycled Product Purchases *and*;
5. Mandatory Recycling Hauler Ordinance *and*;
6. Must meet the specified number of criteria from each of the three categories below. *Municipalities with unit pricing programs are only required to meet the Buy Recycled criteria specified below*

Participation (comply with 3 below)

- 2 town-wide recycling education mailings/year
- Recycling participation "lottery"
- Direct marketing campaign
- Block leader program
- Bi-lingual recycling outreach
- Participate in Massachusetts Recycles Day

Access (comply with 3 below)

- Ordinance banning collection of yard waste w/MSW
- Commercial recycling program
- Recycling at all public schools
- Multi-family recycling program
- Collection of 3 types paper, all plastics
- Textiles collection program
- Permanent collection site(s) for 4 or more HHP items

Buy Recycled (comply with 2 below)

- Testing and evaluation of 2 recycled products
- Adoption of federal recycled paper standard
- Attendance of 3 municipal representatives at Buy Recycled Vendor Conference

**TABLE 1-14B: PROPOSED MRIP ELIGIBILITY CRITERIA: YEAR TWO
JANUARY-JUNE, 1999**

Municipalities will be asked to meet the following criteria by June 1, 1999 to qualify for MRIP payments for the second six months of FY99.

1. DARP and DACP status *and*;
2. Buy Recycled Purchasing Policy *and*;
3. Parallel Access between trash and recycling collection *and*;
4. Tracking System to Report all Municipal Recycled Product Purchases *and*;
5. Mandatory Recycling Hauler Ordinance *and*;
6. Ordinance Banning Collection of Yard Waste with MSW *and*;
7. Must meet the specified number of criteria from each of the three categories below. *Municipalities with unit-pricing programs are only required to meet the Buy Recycled criteria specified below*

<u>Participation</u> (comply with 3 below)	<u>Access</u> (comply with 4 below)	<u>Buy Recycled</u> (comply with all below)
<ul style="list-style-type: none"> • 2 town-wide recycling education mailings/year • Recycling participation "lottery" • Direct marketing campaign • Block leader program • Bi-lingual recycling outreach • Participate in Massachusetts Recycles Day 	<ul style="list-style-type: none"> • Commercial recycling program • Recycling at all public schools • Multi-family recycling program • Collection of 3 types paper, all plastics • Textiles collection program • Permanent collection site(s) for 5 or more HHP items 	<ul style="list-style-type: none"> • Testing and evaluation of 2 recycled products • Adoption of federal recycled paper standard • Attendance of 3 municipal representatives at Buy Recycled Vendor Conference

**TABLE 1-11C: PROPOSED MRIP ELIGIBILITY CRITERIA: YEAR THREE
JULY-DECEMBER, 1999**

Municipalities will be asked to meet the following criteria by December 1, 1999 to qualify for MRIP payments for the first six months of FY00.

1. DARP and DACP status *and*;
2. Buy Recycled Purchasing Policy *and*;
3. Parallel Access between trash and recycling collection *and*;
4. Tracking System to Report all Municipal Recycled Product Purchases *and*;
5. Mandatory Recycling Hauler Ordinance *and*;
6. Ordinance Banning Collection of Yard Waste with MSW *and*;
7. Permanent Collection Site(s) for 4 or more HHP Items *and*;
8. Unit-based pricing Program or a Standardized Recycling Rate of 35%; *and*
9. Must meet the specified number of criteria from each of the three categories below. *Municipalities that meet a standard recycling rate of at least 35% or have unit-pricing programs, are required to meet the Buy Recycled criteria specified below*

<u>Participation</u> (comply with 3 below)	<u>Access</u> (comply with 4 below)	<u>Buy Recycled</u> (comply with all below)
<ul style="list-style-type: none"> • 2 town-wide recycling education mailings/year • Recycling participation "lottery" • Direct marketing campaign • Block leader program • Bi-lingual recycling outreach • Participate in Massachusetts Recycles Day 	<ul style="list-style-type: none"> • Commercial recycling program • Recycling at all public schools • Multi-family recycling program • Collection of 3 types paper, all plastics • Textiles collection program • Permanent collection site(s) for 5 or more HHP items 	<ul style="list-style-type: none"> • Testing and evaluation of 2 recycled products • Adoption of federal recycled paper standard • Attendance of 3 municipal representatives at Buy Recycled Vendor Conference

**TABLE 1-14D: PROPOSED MRIP ELIGIBILITY CRITERIA: YEAR THREE
JANUARY-JUNE, 2000**

Municipalities will be asked to meet the following criteria by June 1, 2000 to qualify for MRIP payments for the second six months of FY00.

1. DARP and DACP status *and*;
2. Buy Recycled Purchasing Policy *and*;
3. Parallel Access between trash and recycling collection *and*;
4. Tracking System to Report all Municipal Recycled Product Purchases *and*;
5. Mandatory Recycling Hauler Ordinance *and*;
6. Ordinance Banning Collection of Yard Waste with MSW *and*;
7. Permanent Collection Site(s) for 4 or more HHP Items *and*;
8. Unit-based pricing Program or a Standardized Recycling Rate of 35% (curbside muni's) Standardized Recycling Rate of 35% or more (drop-off muni's) *and*;
9. Must meet the specified number of criteria from each of the three categories below. *Municipalities with unit-pricing programs are only required to meet the Buy Recycled criteria specified below*

<u>Participation</u> (comply with 3 below)	<u>Access</u> (comply with 5 below)	<u>Buy Recycled</u> (comply with all below)
<ul style="list-style-type: none"> • 2 town-wide recycling education mailings/year • Recycling participation "lottery" • Direct marketing campaign • Block leader program • Bi-lingual recycling outreach • Participate in Massachusetts Recycles Day 	<ul style="list-style-type: none"> • Commercial recycling program • Recycling at all public schools • Multi-family recycling program • Collection of 3 types paper, all plastics • Textiles collection program • Permanent collection site(s) for 6 or more HHP items 	<ul style="list-style-type: none"> • Testing and evaluation of 2 recycled products • Adoption of federal recycled paper standard • Attendance of 3 municipal representatives at Buy Recycled Vendor Conference

To assist in the implementation of MRIP, EOEa and DEP have hired seven regional recycling coordinators through grants to regional groups and large municipalities. MRIP Coordinators will provide technical assistance to municipalities striving to meet MRIP eligibility criteria and increase the effectiveness of their recycling, source reduction, composting, and HHP collection programs.

Recycling Participation Campaign

By providing equipment and supplies to municipalities through the MRIP grants, EOEa/DEP has provided access to recycling for 5.3 million residents (approximately 85% of the population). While the Department will continue to promote improving access to recycling programs, more emphasis needs to be placed on increasing participation in the programs.

The Department recognizes the need to increase participation in existing recycling programs and will work toward that goal by implementing a statewide consumer education effort called the Recycling Participation Campaign (RPC). The goal of the RPC is to influence consumer recycling behavior, as well as the purchase of materials, made with recycled materials through an integrated advertising and public relations effort targeted at individuals who have access to, but do not fully participate in, municipal recycling programs. The benefits of such a campaign are that it targets both municipal and commercial generators, assists in development of long-term recycling "habits," and is not dependent on municipal budgets. The goal is to develop a focused and effective advertising campaign targeted toward citizens of the Commonwealth. The campaign will be developed in concert with major recycling industry representatives from the paper, steel, and plastic industries, and environmental groups.

In FY96, the Department contracted with Cambridge Reports International (CRI) to research barriers and attitudes towards recycling. Their report concluded that while 45% of MA residents regularly recycle target materials (glass, paper, aluminum, steel, plastic), 29% demonstrated low to non-existent participation levels. Data from CRI's research as well as the Department's data on municipal collection rates suggests that the 29% "Non-Recycler" group is not evenly distributed state wide but is concentrated mostly in certain urban centers such as Boston, Lowell, and New Bedford. Fifty-four percent of the population of Massachusetts is concentrated in 50 of the 351 municipalities, and the urban areas show the lowest participation rates.

The Department then published a request for proposals and selected an advertising and public relations firm to help implement the state-wide Recycling Participation Campaign (RPC). The RPC has used CRI's research findings to develop messages (theme, slogan and logo) and public relations programs that it hopes will affect consumer recycling and purchase behavior. The messages will focus on the inherent benefits of recycling and "buying recycled," including the number of jobs created and maintained, resources saved, and the reduced need for landfills and combustion facilities. Phase I of the Campaign commenced in August, 1997, with a pilot program of advertising and public relations focused on East Boston. This program is currently being evaluated. In Phase II, the program will be rolled out in other cities suffering high recycling costs due to low participation rates. Eventually, a state-wide advertising campaign will be developed to support local, grass-roots efforts.

TABLE 1-15: RESTRICTED MATERIALS

Lead Batteries
Leaves
Tires
White Goods
Other Yard Wastes
Aluminum Containers
Metal or Glass Containers
Single Polymer Plastics
- PET (#1 plastics)
- HDPE (#2 plastics)
Recyclable Paper
Proposed for 1998:
- Cathode Ray Tubes

Compliance and Enforcement of the Waste Bans

The 1990 Solid Waste Management Facility Regulations established a series of bans on the disposal of several types of solid waste materials (see **Table 1-15**) that were phased in over a five year period. The goal of the waste bans was two-fold: to preserve capacity at disposal facilities by encouraging expansion of recycling programs; and to protect public health, safety, and the environment by banning disposal of certain materials with hazardous components such as lead-acid batteries.

To implement the waste bans, a series of DEP policies known as the "Recycling Rules" were developed which established how landfills and combustion facilities were to implement the waste bans. In addition, to assist the disposal facilities and the municipalities, DEP established the Department Approved Recycling Program (DARP) and Department Approved Composting Program (DACP). These two programs established minimum criteria which a municipality's recycling program had to meet in order to receive a DARP or DACP certification. Municipalities with DARP and DACP status were not subject to random inspections to determine whether or not disposal facilities complied with the waste bans. Over the past two years EOEA/DEP have received numerous comments that there is inadequate enforcement of the waste bans and a lack of monitoring compliance with DARPs and DACPs. Several commentators have urged DEP to take a stronger enforcement role regarding the waste bans to ensure that they are being met by waste generators. Other municipal and industry representatives have expressed equally strong opposition to the DARP and DACP requirements.

When DARP criteria were put in place in 1993 and 1994, approximately 150 municipalities were able to pass without taking further action to provide better access to recycling. Today over 300 municipalities have DARP exemption status, representing 97% of the residents in Massachusetts.

TABLE 1-16: RECYCLING RULES PROGRAM RECOMMENDED ACTIONS

OBJECTIVES	ACTION	POSITIVE IMPACT
FACILITY TARGET	Tougher enforcement	Increased deterrence
INCREASE COMPLIANCE WITH WASTE BAN INSPECTION RULES	DEP staff inspections at facilities of commercial and non-DARP waste loads.	Raise enforcement credibility and increase likelihood of load rejections.
INCREASE NUMBERS OF LOADS INSPECTED	Change DEP rule to extend waste ban enforcement to transfer stations.	Substantially increase inspection locations.
INCREASE NUMBER OF NON-DARP INSPECTIONS	Change DEP rule to require a minimum number of non-DARP vehicle inspections	Likely increase in number of commercial waste load rejections.
INCREASE PRESSURE ON HAULERS TO COMPLY WITH BANS	Consider changing DEP rule to allow facility to charge a waste ban violation fee instead of rejecting the load.	Provide financial incentive for operators to enforce bans against haulers.
INCREASE DISPOSAL FACILITY CONTRIBUTION TO RECYCLING	Audit recycling plans from disposal facilities. Ensure existence of recycling program elements /output of plans to comply with regulations.	Potential to increase recycling infrastructure investment. Increase industry participation in municipal and commercial recycling efforts.
MUNICIPAL TARGET	Enforce/raise standards	Increased diversion
ENSURE MUNICIPAL COMPLIANCE WITH DARP REQUIREMENTS	DEP field inspection of recycling drop-off stations. Audit curbside programs. Suspend DARP status for non-compliance with criteria.	Increase credibility of DARP exemption. Improve operations at drop-off programs.
INCREASE MUNICIPAL RECYCLING PROGRAM PERFORMANCE	Raise eligibility standards for DARP status to include: unit-based pricing option, require equivalent trash and recycling services, require ordinance that independent haulers must offer recycling services to all residents.	Promote source reduction, increase diversion and participation rates; expand access to recycling services.
HAULER TARGET	Enforce/raise standards	Increased diversion
MANDATORY RECYCLING LEGISLATION	Consider proposing legislation requiring haulers to offer recycling services to residents and businesses.	Eliminate need for local hauler ordinances.

Perhaps due to the overwhelming municipal compliance with DARP/DACP exemption criteria, there have been relatively few loads rejected as a result of facility inspections.

The Draft Update outlined a number of options for improving the effectiveness of the "Recycling Rules" as a means of increasing the statewide recycling rate. After careful consideration of the comments presented during the Draft Update hearings in the fall of 1997, DEP has decided to move forward with the proposed initiatives which are summarized in Table 1-16. EOE and DEP feel that it is important to have both incentives and minimum recycling programs to meet the 46% recycling goal. DEP will assist municipalities in setting up these basic programs in every community so that they are cost effective and that recycling benefits are realized by the communities and the state. Two initiatives in particular -- extending waste ban inspections from disposal facilities to also include transfer stations, and increasing inspection frequency -- will require a regulatory revision. In addition, the state will propose legislation requiring haulers to offer recycling services to residents and businesses.

Already, DEP is auditing current disposal facility inspections to ensure that they are being conducted on a regular basis, and that appropriate follow-up actions are being taken. Likewise, DEP is reviewing past and present municipal DARP forms to ensure that all municipalities which have claimed an exemption do in fact meet the DARP criteria for minimum access to recycling.

One of the new standards is to increase the eligibility standards for DARP status. The baseline DARP criteria set four years ago does not always reflect the level of program commitments

**TABLE 17:
DARP CRITERIA (MUNICIPALITIES MUST MEET CRITERIA IN EACH CATEGORY FOR THEIR
WASTE TO BE EXEMPT FROM INSPECTIONS FOR RECYCLABLE MATERIAL)**

Categories	DARP Criteria: 1995-1998	DARP Criteria: 1998-2000
<ul style="list-style-type: none"> Commitment to Recycling 	<ul style="list-style-type: none"> <u>Municipalities with drop-off recycling programs</u>: accept newspaper plus two other types of paper, and glass, metal and two types of plastic containers; OR <u>Municipalities with curbside recycling programs</u>: collect newspaper plus one other type of paper, and glass, metal and one type of plastic containers. 	<ul style="list-style-type: none"> Meet previous criteria; AND <u>Municipalities with curbside trash service</u>: provide curbside recycling service; Consider requiring mandatory ordinance directing independent residential haulers to offer recycling services to residents.
<ul style="list-style-type: none"> Public Education Efforts 	<ul style="list-style-type: none"> Promote recycling participation through an annual mailing, and through the media 4 times a year; OR Promote recycling participation through an annual mailing and by enacting a mandatory recycling by-law, ordinance or executive order; OR Promote recycling with minimum expenditures of \$0.25 per ton of refuse disposed, or \$20,000 annually. 	<ul style="list-style-type: none"> Either meet previous criteria; OR Conduct unit-base pricing or trash sticker program.
<ul style="list-style-type: none"> User Access to Recycling 	<ul style="list-style-type: none"> <u>Municipalities with drop-off recycling programs</u>: keep drop-off recycling area open 20 hours per week, or the same hours as trash collection area, or local government offices; OR <u>Municipalities with curbside recycling programs</u>: provide curbside collection service municipality-wide, at least bi-weekly. 	<ul style="list-style-type: none"> <u>Municipalities with drop-off recycling programs</u>: keep drop-off recycling area open 30 hours per week, or the same hours as trash collection area, or local government offices; OR <u>Municipalities with curbside recycling programs</u>: meet previous criteria.

essential to engaging all residents in recycling and producing the higher diversion rates required to achieve the Commonwealth's goals. Modifications to the DARP criteria are aimed at closing the remaining gaps in residential access to recycling services. For example, one of the new criteria will require municipalities that provide curbside trash service to also provide curbside recycling service, thereby making recycling as convenient as trash disposal. Municipalities that demonstrate a long-term cost increase in solid waste collection and disposal from curbside recycling, may be exempted from this requirement. In December 1996, and January 1997, DEP held five public meetings around the state regarding tightening of DARP criteria. Based on input from those meetings, DEP plans to modify the DARP criteria, effective December 31, 1998, as outlined in **Table 1-17**.

DEP will also combine the DARP and DACP exemption forms when those modifications take effect. In other words, municipalities would need to meet both the DARP and DACP criteria in order for their waste to be exempt from inspection at the disposal facilities. The DACP criteria are listed in **Table 1-18**.

As the DARP requirements become stiffer on January 1, 1999, additional waste management facilities will be eligible for inspection. DEP will increase its auditing procedures related to disposal facility inspections to ensure that they are being conducted on a regular basis, and that appropriate follow-up actions are being taken. Still, we expect most municipalities will retain DARP status when the new recycling rules go into effect.

TABLE 1-18: DACP CRITERIA	
Category	DACP Criteria (Municipality must meet at least one of the criteria in each category)
Commitment to Composting	<ul style="list-style-type: none"> Enact a by-law, ordinance, regulation or executive order which mandates source separation and composting of leaves and yard waste, and/or excludes them from solid waste collections. Establish a program for curbside or drop-off collection and composting of leaves and yard waste. Operate a composting program that is registered with and approved by the DEP.
Public Education Efforts	<ul style="list-style-type: none"> Promote composting program through an educational mailing and four media announcements per year. Promote recycling and composting with expenditures of \$0.25 per ton of refuse disposed, or \$20,000 annually.
Access to Composting Services	<ul style="list-style-type: none"> Enforce exclusion of leaves and yard waste from solid waste collection and disposal. Conduct weekly drop-off and/or curbside composting program for leaves and yardwaste available to all residents from March through November. Provide curbside collection of leaves and yard waste lasting at least four weeks in spring and four weeks in the fall; and offer drop-off composting program or promote home composting (e.g. "Don't Trash the Grass") options in the summer.

One million Massachusetts residents still lack access to recycling because they reside in apartment buildings or are served by private trash haulers that do not provide recycling service. These two groups represent about 16% of the Commonwealth's population. EOEA and DEP will consider the following options, to address this issue.

- Establish an MRIP condition requiring municipalities to establish a local ordinance that requires private haulers to offer recycling service by December 1, 1998, to be eligible for incentive payments.
- Establish an MIRP condition requiring municipalities (rather than haulers) to establish an apartment recycling program by December 1, 1998, to be eligible for incentive payments.
- Establish a DARP condition requiring municipalities to establish a local ordinance that requires private haulers to offer recycling by December 31, 1998, to receive DARP status.
- Propose legislation to either require private haulers to offer recycling service or require apartments buildings to provide recycling service to residents.

RULES TO EXPAND RECYCLING ACCESS:		
Option:	status	Provisions:
MRIP (Grant eligibility requirement - Year 1)	<i>done</i>	Local ordinance requiring independent haulers to provide same levels of recycling as those provided by the municipality (12/1/98).
DARP Requirements	<i>proposed</i>	Municipalities must pass local ordinance requiring independent haulers to offer recycling services to residents (12/31/98).
Legislation	<i>under consideration</i>	Requiring generator or hauler to recycle (2000)

These options would be discussed in public meetings and decided over the course of the next six months. This will provide recycling access and level the playing field for all independent haulers in Massachusetts. Many Northeastern states have adapted similar legislation, or require local governments to establish recycling for 100% of residents, which in turn has led to ordinances on locally licensed haulers. In some cases, customers have the option of whether or not they want

to procure recycling services and in other cases, procurement of the recycling service is mandatory. States such as Rhode Island, extend recycling access requirements to all commercial buildings.

In addition the term "offer" will need to be further clarified as it relates to haulers' responsibilities (whether voluntary or mandatory). While some of these haulers have invested in recycling trucks and equipment, there are many others who do not offer any recycling services. Some independent trash hauler have said they fear that the investment will backfire when competitors offer to cut their rates -- preventing them from recovering capital costs on brand new equipment. Other independent trash haulers have fears that the apartment landlords will resent them for bringing the "hassle" of recycling to their apartments building -- and will turn to their competitors for a "simpler" hauling solution.

Meanwhile, DEP's Recycling Transfer Station grants have proven to be a tremendous gain for municipalities and their independent haulers. By offering a simple local recycling alternative, the Northern Berkshires have increased recycling significantly, and attribute much of this growth to private subscription haulers using the recycling transfer station. These facilities also help lower the cost of transporting recyclables to processing locations. In 1997, DEP has offered similar grants in support of these private partnerships to Salem, Marblehead, and Newburyport. Smaller scale grants are available to municipalities who wish to open their drop-off recycling programs to subscription haulers.

Goal 2000 Recycling Market Development Plan

The Goal 2000 Recycling Market Development Plan emphasizes financial, technical, and planning assistance to the recycling industry, along with the purchase of recycled products. The Market Development Plan is aimed at making recycling collection programs sustainable by increasing demand for collected recyclables. The Plan, which consists of five primary initiatives summarized in **Table 1-19**, provides assistance to the recycling processing industry and manufacturing companies that produce products with recycled content.

TABLE 1-19: GOAL 2000 RECYCLING MARKET DEVELOPMENT PLAN INITIATIVES

RECYCLING LOAN FUND: Provides loans and leverages additional capital for new or expanding recycling businesses

TECHNOLOGY RESEARCH AND DEVELOPMENT: Applied research and development of new recycling related technologies, including pilot projects and business technical assistance conducted by the University of Massachusetts and the Chelsea Center for Recycling and Economic Development

RECYCLING MARKETS STRATEGIC PLAN: Economic study on the supply and demand of major recyclables

STATE AGENCY BUY RECYCLED: State purchasing contracts, conferences, and promotion related to recycled product purchasing

MUNICIPAL BUY RECYCLED: Buy Recycled grant conditions for both the core grants and municipal recycling incentive program

Recycling Loan Fund

The Recycling Loan Fund is a state-financed loan, created by the CEF, that addresses the investment community's perceived risks when lending to recycling-related businesses. This uncertainty stems from their perceptions about regulatory dynamics and rapid changes in supply and demand for commodity-based products. The Recycling Loan Fund helps to resolve this concern by providing direct loans to small recycling-related businesses, while also increasing access to larger amounts of capital from other lenders. The Loan Fund will receive \$1.125 million in fiscal year 1998, as EOEA and DEP move to fully capitalize the Fund at \$4.35 million. As the recycling industry grows in Massachusetts, demand for the Loan Fund also continues to grow. The Loan Fund is an important strategy to provide financial assistance to the recycling industry and spark the development of new recycling businesses. Development of recycling businesses locally has the synergistic effect of stimulating demand for recyclables from both residential and commercial sources. Additional planning and technical assistance is provided by the Massachusetts Office of Business Development, the Strategic Envirotechnology Partnership (-STEP), and DEP staff.

Technology Research and Development

EOEA and DEP will stimulate technological innovation in the recycling processing industry and in manufacturing of recycled products by partnering with the University of Massachusetts-Donahue Center and the Chelsea Center for Recycling and Economic Development. Research projects will focus on creating new processing techniques to recycle a greater range of materials, developing new uses for recyclables, and initiating pilot projects to evaluate and test new technologies and products.

Recycling Market Development Strategic Plan

EOEA and DEP, in cooperation with the Chelsea Center, Massachusetts Office of Business Development, and other relevant stakeholders, will conduct a strategic assessment of Massachusetts' recycling markets and business development opportunities. The study, the cost of which we estimate will not exceed \$150,000, will, among other things:

- assess the amount of recyclables collected and project future collection by material;
- evaluate the potential use of those materials by Massachusetts manufacturing companies;
- identify the barriers to expanding the use of recyclables by in-state manufacturers;
- assess state resources available to address barriers; and
- recommend solutions to overcome the barriers based on available resources.

This plan will provide the baseline for evaluating the demand for recyclables collected in the Commonwealth so that we can increase in-state processing and manufacturing thus, creating jobs and greater economic development. This plan would be used as a basis for allocating future CEF funds into demand-side projects. It will be completed in FY 98, in time to use it for the FY 99 budget cycle. The Chelsea Center will play a lead role in coordinating among agencies and developing the study.

State Agency Buy Recycled Activities

EOEA and DEP will continue their partnership with the Executive Office of Administration and Finance to increase purchases of recycled products by state agencies. Our original goal of increasing state agency purchasing from \$34 million in FY97 to at least \$40 million by the year 2000 (a 50 % increase over 1996 purchasing levels) will be reevaluated. Recycled product purchases will help promote state purchasing contracts for recycled products. Through the Clean Environment Fund, state purchasing officials will receive funding to purchase new recycled products for agencies to test and evaluate. As these products become accepted, state contracts will shift from providing state agencies with the *option* to purchase recycled products, to *requiring* the purchase of recycled products by state agencies. DEP and EOEA are also piloting the strategic purchase of specific recycled materials, such as recycled paint, which is now offered to municipalities through DEP's Municipal Recycling Grant Program.

By increasing recycled product purchasing in the Commonwealth, we can generate two benefits for manufacturers of recycled products. First, they will receive direct business from state agencies. Second, their sales to state agencies will serve as a springboard for these entities to grow and market themselves to other market sectors, including local governments, institutions, and private businesses. Increased production of recycled products will, in turn, benefit

recycling processors, who will receive more revenue for the materials they process, and municipal and commercial recycling programs, which will receive more revenue for the materials they collect.

**TABLE 1-20: GOAL 2000 RECYCLING
MARKET DEVELOPMENT PLAN OBJECTIVES**

Complete study with current status and projections of supply and demand for major recyclables in Massachusetts

Increase number of recycling-related manufacturing jobs from 12,000 to 18,000, a 50% increase, by the year 2000

Capitalize the Massachusetts Recycling Loan Fund to \$4.35 million

Establish Buy Recycled Purchasing Policies in 75 percent of municipalities

Municipal Buy Recycled Activities

Municipalities can purchase recycled products from the state contracts mentioned above. Two primary initiatives will be implemented to increase recycled product purchasing by municipalities: direct marketing (including financial incentives) and recycling grant conditions.

Direct marketing efforts will include direct written marketing materials, an annual conference to highlight new innovations in recycled products, and special financial incentives to try new recycled products. Under the MRIP program discussed above, municipalities will need to adopt an increasing number of initiatives to improve their "Buy Recycled" programs. In order to qualify for the incentive payments, municipalities must adopt a "Buy Recycled" policy to buy recycled products whenever they are readily available at the same quality and price as non-recycled products. The Core Equipment Grants Program will also leverage municipal buy recycled activities by requiring municipalities to commit to a buy recycled purchasing policy or preference to be eligible for grants. Over the course of the three-year program, municipalities will: need to track recycled product purchases; meet Federal standards for recycled content for paper; participate in the Commonwealth's annual vendor fair and conference; and test new recycled products. In addition, a new short-term grant program will provide matching funds for the purchase of recycled paint by municipalities. In future years, matching grants may also be used to provide an additional incentive for municipalities to try other new recycled products.

Reducing Toxics in the Waste Stream

Nationwide, consumers are growing more aware of environmental and public health consequences of using and disposing of hazardous products. These products are routinely used in homes and by small businesses. People now realize that responsibility for environmental protection rests not just with big business, but also with each of us in how we buy, use and dispose of household products. This new sense of accountability has led consumers to buy "greener" products and seek safer disposal alternatives.

In Massachusetts and in many parts of the country, access to hazardous household product (HHP) collection programs has not been fully implemented and participation in existing programs is generally low, (typically 2 - 6%). The most common practice in managing unwanted HHP has been holding one-day collection and disposal programs. These programs tend to collect all items perceived to be hazardous and dispose of them as hazardous waste. Since these programs are generally held once per year, they do not constitute a convenient disposal option for most residents. In addition, they are expensive because materials must be moved off the collection site without much consolidation. Furthermore, materials are often not prioritized for collection based on the risks they pose to human health or the environment. The result is only a small amount of the potentially harmful materials generated in homes across the state are being captured and, at the same time, municipalities are incurring significant costs for their collection. In addition, many communities do not hold any kind of hazardous household product collection program, which leaves residents holding many hazardous materials in their homes, thus creating additional risks.

To address these concerns, the Commonwealth released a plan in July 1996, entitled "Massachusetts Plan for Managing Hazardous Materials from Households and Small Businesses"¹. This plan addresses the toxicity of components of the solid waste stream and encourages sound management of HHP in a way that minimizes costs to municipalities while maximizing environmental protection. The HHP plan sets forth goals for the establishment of a collection system for HHP.

- Within 2-4 years, all municipalities should have access to permanent collection programs for all priority materials
- Increase the collection of priority materials
- Develop cost-effective and environmentally protective programs
- Establish targeted education programs as opposed to a "one size fits all" approach
- Ensure phased statewide development of comprehensive HHP management programs consistent with EOE's Watershed Initiative
- Link environmental protection with job creation and economic development through greater recycling of priority materials

¹ A copy of this plan may be obtained from the DEP Infoline by calling 617-338-2255.

This approach emphasizes prioritizing collection of material types based on their prevalence in the HHP stream, their toxicity, the opportunity to reuse and/or recycle the materials, and establishing local permanent collection opportunities to increase convenience for consumers. Municipalities are encouraged to phase in local collection of priority materials over time as budgets and other resources allow. **Table 1-22** outlines several collection options for hazardous products.

TABLE 1-22: HHP COLLECTION OPTIONS

- OPTION 1** - Phased development of local, permanent collection of Category I (high volume) and some Category II ("universal waste") priority materials (see table 1-23). Remaining materials collected through semi-regional center or one-day collections.
- OPTION 2** - Local collection of all three categories of priority materials at a permanent facility.
- OPTION 3** - Development of small, regional permanent collection centers to collect all three categories of priority materials (4-8 municipalities per center).

The EOE/DEP plan identifies three categories of priority materials which are described in (see **Table 1-23**). Surplus paint and used motor oil are the two highest volume materials (category I) in the HHP stream and both can be reused and/or recycled. EOE/DEP have focused on collections of these materials by helping to make collection of paint and used motor oil cost-effective and convenient. The HHP grants program, which is in its third year, provides funds for municipalities to purchase paint sheds and oil collection tanks. Collection programs for other materials which contain toxics, such as mercury or other heavy metal bearing products (category II), are being tried on a pilot basis throughout the state. Finally, EOE/DEP are investigating whether any of the remaining HHP materials (category III) that have historically been disposed of with household trash can be cost effectively reused, recycled or managed safely in municipal solid waste disposal facilities. "Collection programs for category II Materials that

contain mercury and heavy metals, will be made easier by the promulgation of the Universal Waste Rule (URule). The URule was promulgated by EPA in May, 1995 to streamline and target regulatory requirements for hazardous wastes that present low risk during collection, storage, and transportation. The URule aims to reduce the costs of safely handling and recycling these materials, while improving environmental protection. The materials covered EPA rules are hazardous waste batteries, pesticides subject to a collection program, and thermostats. The Massachusetts URule regulation were finalized in October 1997, and include fluorescent lamps, electrical switches, and manometers in addition to the materials covered under EPA rules."

TABLE 1-23: CATEGORIES OF HHP

Category I - High Volume Materials

- surplus paint
- used oil
- oil filters
- antifreeze
- old gasoline
- car batteries
- household batteries

Category II - Universal Waste Rule Materials

- button cell and NiCd batteries
- pesticides
- mercury-bearing wastes

Category III - Low Volume Materials

- solvent-based glues
- metal cleaners
- toxic art supplies
- old chemistry sets
- photographic materials

Conclusions

As the Commonwealth approaches the year 2000, EOEa and DEP are confident that the proposals for new and enhanced programs discussed in this chapter, will position Massachusetts' cities and towns to maximize the access to and participation in municipal recycling programs. This, in combination with continued work to improve business recycling programs will assure the highest probability of meeting the recycling goals established in the 1990 Master Plan.

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Chapter 2: Solid Waste Program Successes, 1995 and 1996

Introduction

Massachusetts has made further progress toward meeting its 46% recycling goal since the last Update, published in 1995, which reported a recycling rate of 31%. The state achieved a 32% diversion rate in 1995 and 33% rate in 1996. While this rate indicates that our progress toward 46% has slowed, the Commonwealth can point to numerous successes in its solid waste programs. Many of these programs are laying the groundwork today for what we hope will be future increases in the recycling rate. In addition to continuing to improve recycling, the Department has also been successful in continuing to negotiate the closure of unlined landfills, thus protecting the environment from potential environmental threats.

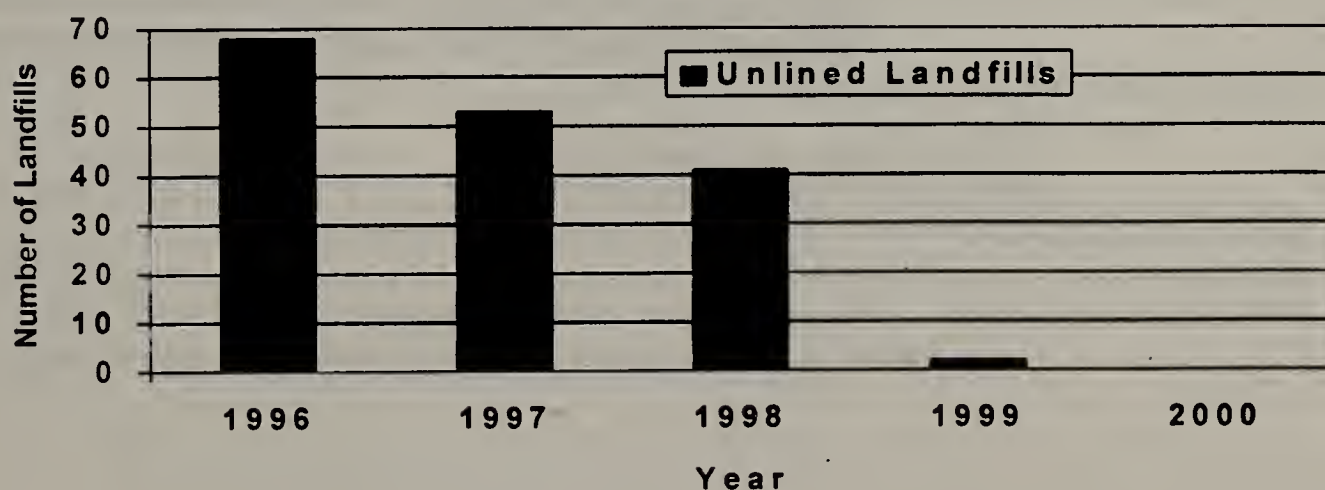
Closure of Unlined Landfills

DEP has been working with municipalities across Massachusetts for several years to close their unlined landfills. During 1995 and 1996, DEP negotiated consent orders for closure of landfills which represented a significant threat or a potential threat to public health, safety or the environment. As of January 1, 1997, 57 unlined municipal landfills had signed consent orders for closure no later than December 31, 1999. During the year, 41 additional consent orders were negotiated bringing the total to 98. Fourteen landfills stopped accepting solid waste in 1995, of which six received final caps, five were partially capped and three were not yet capped. During 1996, 17 additional landfills stopped accepting waste, of which 6 were capped, 5 partially capped, and 6 not yet capped. **Table 2-1** indicates the progress made since 1990. It is projected that all unlined landfills will stop accepting waste by the end of 1999 (see **Figure 2-1**).

TABLE 2-1: PROGRESS IN LANDFILL CLOSURES SINCE 1990*

	Number of Landfills
Landfills Operating during 1990	185
Landfills that Ceased Operations since 1990	113
Landfills Operating during 1997	73**
Landfills Projected to Operate during 2000	11
* The Landfills discussed in this Table do not include ash-only landfills.	
** The Crapo Hill Landfill in Dartmouth began operations after 1990.	

Figure 2-1: Number of Unlined Landfills (1996-2000)



The municipal investment in closing the unlined landfills is significant. In the DEP Southeast region, this investment has been estimated by DEP to be nearly \$109 million to cap and close 868 acres at 42 landfills. This averages to \$125,500 per acre, but includes not only the costs of capping the landfill (generally approximately \$60,000 per acre) with the impermeable cap, but also conducting a landfill assessment and the engineering costs associated with developing the closure design and specifications.

Six state programs assist municipalities in closing unlined landfills (see **Table 2-2**). The first, the Capping Grants program, was initiated by legislation passed in 1983 and provided \$10 million for closures of municipal landfills. This program will be completed in 1997 and will have assisted in the closure of 29 landfills. The second is a grant program administered by DEP using funds provided by the Massachusetts Highway Department. Thirty-two cities and towns will receive grants totaling \$5 million toward capping their landfills. The third program will provide 2.5 to 3 million cubic yards of clay from the central artery project to cap landfills close to Boston. The clay will be provided at no cost to the 82 eligible municipalities,

which represents a savings of \$40 to \$50 million to those communities. DEP will continue to work with municipalities to ensure that all unlined landfills are assessed and properly closed. DEP will also extend a program developed last year to provide assistance through the State Revolving Loan Fund. Recent changes in DEP regulations allow funds addressing remediation of non-point sources of pollution to be used for landfill closure.

DEP has also adopted two policies which provide an opportunity to generate revenues from extended landfill operations that reduce or eliminate municipal borrowing to fund capping costs. Under the Policy on Approving Tonnage Increases to Facilitate Unlined Municipal Landfill Closures (BWP-95-22), municipal landfill operators can request to increase the landfilling of non-MSW materials in order to generate revenue as well as save the cost of grading and shaping fill. The Innovative Technology Policy for Municipal Landfill Closures allowed a limited number of landfill reclamation projects to proceed to environmental review. These projects, if developed would generate revenue for closure costs by reclaiming and reusing air space.

TABLE 2-2: LANDFILL CLOSURE ASSISTANCE

PROGRAM	FUNDING	NO. LANDFILLS
Landfill Capping Grant Program	\$10 million	29
Central Artery Closure Grants Program	\$5 million	32
Central Artery Clay Program	2.5 - 3 million cu.yd. of clay for capping in Phase II	82 eligible to receive
State Revolving Loan Fund	\$2 million-fundable list \$8 million - extended list	10
Policy on Tonnage Increases to Facilitate Closures	\$10-14 million estimated savings and revenue	14
Policy on Innovative Closure Technology for Landfill Reclamation	\$2 million per landfill in savings	1 active, 3 pending

The positive environmental impact of closing landfills can be demonstrated in the reduction of leachate generated within the landfills and entering ground and surface waters. As shown in **Figure 2-2** the capping of unlined landfills will result in the cumulative reductions of 1.47 million gallons of leachate through 2001.

Figure 2-2: Estimated Cumulative Reductions in Leachate Generation From Capping 1744 Acres of Landfills



In part, DEP has been able to pursue closures without creating a shortage of capacity because of the tremendous municipal and business increases in recycling and composting “capacity” in Massachusetts. These increases have made it possible to close unlined landfills without the need to construct significant new disposal capacity. From 1990 through 1996, diversion of MSW to recycling and composting grew from approximately 0.07 million tons per year to 2.3 million tons per year. The diversion of this MSW from disposal in 1996 is equivalent to 4.5 landfills or incinerators handling 1500 tons per day (the largest in our state).

Municipal Recycling Grants Progress

The Municipal Recycling Grants program continues to provide significant benefits to recycling and composting programs.

Since its inception, the grant program has contributed to a number of recycling successes (see **Table 2-3**). In FY97, \$4.2 million from the Clean Environment Fund (CEF) was allocated for recycling. Of these funds \$3.0 million went to municipal programs and about \$1.2 million to commercial recycling. Table 2-4 summarizes the direct municipal expenditures and types of equipment granted in FY96 and FY97. In the years 1995 and 1996 we saw further

TABLE 2-3: RECYCLING SUCCESSES

- Approximately 1.4 million more Massachusetts residents have access to curbside recycling today than they did in 1992. Today, nearly 69%, or 4.3 million residents, have curbside pickup of some or all of their recyclables.
- 97% of residents in 334 communities have the opportunity to recycle newspapers.
 - 70% of those residents can recycle newspapers at the curb
 - 30% of those can recycle newspapers at drop-off programs
- 5.4 million residents, or 91% of the population, in 298 cities and towns, have access to either curbside or drop-off, to magazine recycling
 - 65% have magazines collected at the curb.
- Glass is the second most commonly recycled material in Massachusetts. 68% of residents have access to curbside glass collection. 330 communities include glass in their recycling program.
- 5.3 million residents have access (curbside or drop-off) to plastic recycling making plastic one of the most widely recycled materials in the state.
 - 298 municipalities recycle #1 plastic (PET)
 - 314 municipalities recycle #2 plastic (HDPE)

expansion of curbside recycling programs across Massachusetts with seven municipalities starting curbside collection programs or pilot programs including: Brockton; Danvers; Everett; Lynnfield; Lawrence; Rockland; and Saugus. In 1996, five municipalities started curbside collection programs including: Topsfield; Bellingham; Dracut; Lynn; and Gardner.

In FY96, DEP ordered improved (but more expensive) curbside recycling trucks. To offset the additional expense, to allow limited funds to purchase more trucks, and to assist more municipalities, DEP for the first time asked municipalities to contribute \$20,000 toward the purchase of trucks. As a result of receiving truck grants, Stoughton and Bourne are adding newspaper to their curbside programs and Dartmouth is expanding its curbside program city-wide. In FY97, DEP expanded the matching fund concept to communities seeking replacements for homeowner set-out containers. In FY98, these matching grant requirements are being waived for municipalities that start new unit pricing programs. DEP also provides a FY98 matching grant program for the purchase of recycled paint.

TABLE 2-4: SUMMARY OF FY96 AND FY97 MUNICIPAL GRANTS

Grant Item	FY96 Value	FY97 Value
Consumer Education Materials	\$624,430	\$473,176
Curbside Recycling Trucks*	504,770	143,380
Home Composting Bins	295,676	163,834
Used Motor Oil Tanks	87,317	55,449
Surplus Paint Storage Equipment	49,825	31,654
Roll-off Containers	112,795	68,850
Set-out Containers	209,787	195,641
Unit-pricing Materials (bags)	22,521	22,097
Technical Assistance	240,000	141,235
Total Grant Awards	\$2,147,122	\$1,295,316
*In FY96 municipal matching funds enabled awarding 2		

Composting Grants Program

Under the compost bin grant program, grantees receive free bins from DEP which they must sell to the public at a 50% discount from the state contract price. The revenue collected must be used to purchase additional bins. This enables grantees to distribute twice the number of bins provided to them by DEP and makes low-cost compost bins available to the public (\$20 or less). While providing residents with bins at a significant discount, the program also requires them to make a financial commitment, increasing the likelihood that they will use their bins. **Table 2-5** summarizes the compost bin grant program for the past several years.

The total number of compost bins ultimately available to be distributed from FY93 through FY96, considering the grantee cost share component which doubles the number of bins for distribution, is approximately 78,000 bins. At the end of FY96, over 50,000 compost bins had been distributed to the public.

TABLE 2-5: SUMMARY OF COMPOST BIN GRANT PROGRAM

Year	# of Bins Granted	Value of Bins	Number of Grantees	Bins Distributed
FY1993	3,429	\$98,376	1 (pilot)	5,300
FY1994	13,311	\$381,876	55	17,000
FY1995	12,661	\$409,946	99	19,400
FY1996	10,400	\$296,000	76	16,400
TOTAL	39,801	\$1,186,198	184*	58,100
* Total is less than number of grantees due to repeat grantees				

The environmental benefit from distribution of compost bins can be estimated. Each bin can compost approximately 750 lbs year, for an average potential diversion of 29,250 tons per year. Using an average tip fee of \$55 per ton, the compost bins would result in an annual savings of \$1.6 million in disposal fees. The one-time cost to DEP for its share of the bins (39,800) is \$1,186,198. A telephone survey conducted for DEP in 1993 indicated that 28% of Massachusetts households compost at least some of their organic waste, so the potential saturation level for compost bins may be significantly higher than 10% of households or equal approximately 163,000 compost bins. At the rate of 18,000 bins/year this would take five to six more years, although this could be hastened with greater publicity for the program.

Public education plays an important role in increasing the composting rate because, in addition to the volume of organic material that can be diverted through home composting, a population that understands composting will be better able to assess, support, and participate in municipal and commercial composting programs. Since 1991, DEP has offered 15 Network of Home Composters workshops per year. Approximately 3,000 people attend the workshops throughout the year. The workshops provide composting information to the general public and provide interested volunteers with the information and materials needed to promote and demonstrate home composting in their communities. These individuals then become members of the Network of Home Composting Coordinators, spreading information about home composting to their friends, neighbors and colleagues. There are 350 volunteer home composting coordinators whose activities range from giving workshops to producing local television programs on composting. In addition to providing a variety of educational activities on composting, many home composting coordinators assist in compost bin distribution programs in their communities.

Regional/ Municipal Technical Assistance Grants Progress

In FY95, EOEa funded DEP for the express purpose of awarding technical assistance grants of up to \$35,000 per year to regional groups and large municipalities to implement new recycling efforts. Funds are used to hire a recycling coordinator or consultant to address a local or regional recycling barrier or to pilot new or innovative recycling or hazardous household products (HHP) projects that can be replicated in other regions. Management and operational costs of municipal recycling programs are not eligible for technical assistance funding.

In FY 1996 and FY 1997, DEP awarded technical assistance grants totaling \$381,235 to 17 regional groups and municipalities comprising 122 communities. Projects funded include: a fluorescent lamp and battery collection pilot in Barnstable County; recycling outreach to non-English speaking communities in Springfield and New Bedford; hazardous waste management protocol and training for public schools in Franklin County and central Massachusetts; a feasibility study for a regional HHP collection program for Wachusett Watershed communities; and a recycling participation lottery in Waltham and Somerville. See **Tables 2-6** and **2-7** for a complete list of technical assistance grants funded in FY96 and FY97.

TABLE 2-6: FY96 TECHNICAL ASSISTANCE GRANTS		
Grantee	Grant Award	Project Description
Barnstable County	\$25,000	Fluorescent lamp/battery collection pilot
Boston	\$100,000	Recycling education campaign
Cambridge/Waltham/Somerville	\$25,000	Recycling participation lottery and block leader program
Clinton	\$35,000	Regional recycling coordinator/marketing cooperative
Franklin County Solid Waste Management District.	\$20,000	Technical assistance to member towns on recycling operations and documentation of MSW diversion
Hardwick/SCRAM	\$25,000	Regional recycling transfer station development/regional recycling coordinator
Stockbridge	\$10,000	Pilot recycling collection for hospitality sector
TOTAL:	\$240,000	

TABLE 2-7: FY97 TECHNICAL ASSISTANCE GRANTS

Grantee	Grant Award	Project Description
Amesbury	\$20,732	Pilot curbside collection of used motor oil
Essex County	\$23,333	Regional recycling coordinator
Fall River	\$17,500	Regional recycling coordinator
Franklin County Solid Waste Management District.	\$16,170	Hazardous Waste management in schools; farm-based pesticides collection; municipal buy recycled assistance
Greater New Bedford Regional Refuse Management. District.	\$10,000	Recycling education/outreach to Spanish and Portuguese-speaking communities
Northampton	\$16,500	Building materials reuse center
South Central Recycling Association of MASS (SCRAM)	\$8,000	Regional paint collection sites; HHW management in schools
Springfield	\$7,000	Recycling education/outreach to Vietnamese community
South Shore Regional Refuse Disposal. Planning Board	\$10,000	Regional recycling coordinator
Sterling	\$12,000	Feasibility study for regional HHW collection program
TOTAL:	\$141,235	

Hazardous Household Products Management Progress

As mentioned in Chapter 1, EOEA released the "Massachusetts Plan for Managing Hazardous Materials from Households and Small Businesses," in July 1996. This plan describes over 70 projects to manage priority categories of HHPs. For instance, EOEA provided funding to Barnstable County to develop a pilot program to collect and recondition old gasoline. This program is part of an extensive collection program on Cape Cod, in which all 15 municipalities collect used oil, 13 collect oil filters, 8 collect antifreeze, and 5 collect paint products. Several of the HHP programs around the state are discussed in more detail below. For more information on HHP programs, contact EOEA for a copy of the state's plan.

Paint and Used Motor Oil Equipment Grants Progress

In FY 97, EOEA and DEP awarded 22 municipal equipment grants for paint storage equipment and used oil storage tanks. Over the past three years, 61 municipalities have received, or are sharing, paint storage equipment and another 60 received used oil storage tanks. Many other municipalities have started used oil collection programs on their own, raising the total number of municipal used oil collection programs to approximately 159. Through this grant program and these additional municipal collection programs, approximately 384,000 gallons of used oil were collected and approximately 60,000 gallons of paint were collected for reuse, recycling, or safe disposal in

1996 (**Table 2-8**). These programs also supported collection of approximately 10,000 gallons of spent antifreeze and more than 20,000 automotive batteries. In addition to providing equipment to meet capital needs, these grants also include mailings notifying residents of the new programs and training sessions for municipal staff on screening and sorting paint products.

TABLE 2-8: TOTAL SURPLUS PAINT AND AUTOMOTIVE WASTES COLLECTED BY MUNICIPAL PROGRAMS IN 1996*

Material	Amounts (Gallons)	Municipalities
Surplus Paint	60,000	133
Used Motor Oil	384,000	180
Spent Antifreeze	10,700	65
Used Oil Filters	91 (drums)	46

This summary is based on data that was reported by municipalities on their Recycling Data Sheets.

* Reported data often includes materials from municipal vehicles and in some cases materials from small businesses.

Several towns have reported cost savings from collecting paint at one permanent location instead of through one-day collection events. For example, in 1995, Attleboro reported annual cost savings of \$11,000 and Amherst saved more than \$4,000. Some municipal programs have also been able to divert a high percentage of paint for reuse, thus lowering disposal costs by keeping surplus paint out of the waste stream. During the first several months of its program, Leicester diverted 42 % of the paint they collected for reuse by municipalities, residents, or businesses.

Master Service Agreement for Collection

In August, 1996, the Executive Office of Administration and Finance's Operational Services Division (OSD), with assistance from EOEa and DEP, developed a statewide service agreement with four companies for the collection of used motor oil, oil filters, antifreeze, gasoline, and surplus paint. This agreement lowers recycling and disposal costs for both municipalities and state agencies by taking advantage of the Commonwealth's purchasing power. Many municipalities and state agencies had been paying as much as 20 cents per gallon to send used oil for recycling. Now, this service is provided at no cost through the statewide contract. Similarly, the contract provides low prices for collection of the other materials on contract, lowering the barrier of high recycling or disposal costs for municipalities that would like to provide these services to their residents. OSD has also completed a similar statewide contract for collection and recycling of fluorescent lamps, computer equipment, batteries, and PCB ballasts. Another contract is being developed with the Department of Food and Agriculture and DEP to hold several one day collections for waste pesticides at several sites around the state for farmers, grower, pesticide applicators, as well as municipalities and state agencies. A separate component would provide waste pesticide pick up service for public sector agencies. This contract for pick-up service will support municipal and regional efforts to collect pesticides on a permanent basis.

Universal Waste Collection Programs

In May, 1995, the U.S. Environmental Protection Agency promulgated the Universal Waste Rule (URule), streamlining regulatory requirements for hazardous wastes that present low risks during collection and transportation. The URule aims to increase recycling and environmental protection, while reducing the costs of collection and transportation. Massachusetts finalized draft regulations for the Universal Waste Rule, and received authorization from EPA in October 1997. The federal URule includes hazardous waste batteries, a limited set of pesticides, and thermostats. The Massachusetts Universal Waste Rule includes several additional materials, including fluorescent lamps and other mercury containing devices such as electrical switches, thermometers, and manometers.

Concurrent with development of these regulations, EOEA and DEP are supporting five programs to collect Universal Waste materials. These include Barnstable County, Pioneer Valley (through the University of Massachusetts at Amherst), Plymouth and Cohasset (throughout a South Shore coalition), and Westminster and Fitchburg. EOEA and DEP have also worked with the Rechargeable Battery Recycling Corporation (RBRC) to establish a municipal collection and recycling program for rechargeable nickel-cadmium batteries. At no cost to municipalities, RBRC provides collection buckets with a postage paid UPS mailing label to use to send the buckets to a metals reclaiming facility. So far, over 100 municipalities have participated in the program, complementing an extensive retail collection network of nearly 500 locations across Massachusetts. When this program was established in 1995, Massachusetts was the third state in the nation to join the RBRC, and in 1996 became the first to start the municipal bucket program.

The University of Massachusetts at Amherst will be serving as a consolidation point for the collection of mercury-containing materials such as fluorescent lamps, thermostats, and thermometers from 20 municipalities in Western Massachusetts. This program is expected to expand to include collection from small businesses, schools, and other institutions and may also accept additional materials in later years. The program will provide town facilities and residents with the convenience of local collection points and the benefits of increased efficiency and reduced cost from regional consolidation.

Another pilot program serves 13 communities that are part of the South Shore Regional Refuse Disposal Board. The South Shore program is based on two permanent collection points in the host towns of Plymouth and Cohasset that serve as consolidation points for other towns in the group. These two collection points accept fluorescent lamps, thermometers, and thermostats.

Low-Volume Priority Materials Management

The EOEA/DEP plan recommends three options for managing low volume priority materials.

- Collect with other priority materials at permanent, local center
- Collect at a small, permanent, regional center
- Continue to collect through one-day collections

DEP worked with EOEA to develop a guide for municipal and regional recycling program managers, titled "Answers to Commonly Asked Questions about Hazardous Household Products", to use in answering questions from citizens. This guide will serve as the foundation for developing a more detailed and extensive manual to be used by program managers in answering questions from residents. This manual will be supported by an ongoing HHP Prioritization Study, that will attempt to define the best management recommendations for specific product types based on review of waste management technologies and product formulations.

As part of this work, EOEA and DEP are working to identify and address particular areas of concern so that we can make the most out of limited resources in safely managing HHP. While much of this emphasis has been on households, some programs focus on small businesses or institutions. For instance, public schools, with their undocumented stocks of chemicals in laboratories, have been identified as a concern throughout the country. EOEA and DEP have funded a pilot program with Franklin County and the South Central Recycling Association of Massachusetts (SCRAM) to inventory chemicals, institute a computer tracking system for all chemicals used in schools, and safely dispose of unnecessary chemicals. The results from this program will be used to develop a plan for expanding this program to other areas in the Commonwealth.

In 1990, when commercial recycling of paper and cardboard was already widespread in the largest businesses, the challenge was for recyclers to provide services to smaller offices and to add more varieties of paper. Many of the larger businesses in the state have responded both to the waste bans included in the Solid Waste Management Facility Regulations and to the favorable economics of waste reduction and recycling by establishing complete recycling programs which have incorporated numerous source reduction initiatives. WasteCap, a public-private partnership between the business community and DEP, provides the business community with several types of services to foster source reduction and recycling in the business community. WasteCap provides on-site waste assessments, a quarterly newsletter, over-the-phone technical assistance, and topical workshops. These services help companies find workable, cost-effective solutions to reducing waste and increasing recycling. Case studies of such efforts available from WasteCap illustrate the substantial progress businesses have made in their waste management efforts and indicate the huge potential of the business sector in moving the Commonwealth toward its recycling goal. However, as seen in some of the examples in **Table 2-9**, source reduction efforts may also lead to reduced use of many of the most valuable recyclables. For example, many companies no longer ship materials to manufacturing facilities in cardboard, having replaced the use of boxes with the use of shrink wrap, or the reduction in use of high grade office paper. This may reduce the amount of materials available for recycling at the same time it reduces the total amount of waste generated by businesses that requires management.

TABLE 2-9: EXAMPLES OF BUSINESS WASTE REDUCTION EFFORTS

Company	Waste Prevention Impacts
Polaroid	<ul style="list-style-type: none"> From 1988 to 1993, reduced solid waste generation (per unit production) by 31%
Hyde Manufacturing Co.	Putty knife packaging redesign: <ul style="list-style-type: none"> Eliminated 8 tons/yr. in paperboard purchasing New adhesive label contains at least 50% recycled content Saves Hyde \$40,000 per year
Shaw's Supermarkets Inc.	Reusable Shipping Containers: <ul style="list-style-type: none"> Containers used in seafood and meat departments of all stores Damaged containers are broken down and remolded into "new" containers Durable plastic containers are guaranteed for up to five years Waste reduction of 27 tons per week, or 1,404 tons per year Diversion of 11 tons per week from landfills, saving \$600 in tipping fees
Millipore Corp.	Paperless Technologies: <ul style="list-style-type: none"> Using electronic mail and on-line catalogs Purchase of white paper down by 34% Annual and quarterly financial reports on the Internet Elimination of 60,000 multi-paged, printed reports
NYNEX	Double-sided copying environmental "target" for high volume reproduction centers: <ul style="list-style-type: none"> Goal of 85% double-sided copying by January 1, 1998 Potential reduction in the amount of paper used by 27 million sheets per year Potential savings of \$120,000 per year Employee education and promotional aspect to the "target"
EMC Corporation	Pre-paid packaging take-back program: <ul style="list-style-type: none"> Packaging can be reused up to three times 40% of packaging comes back to EMC for reuse Initial packaging costs reduced by 20%
* Information from WasteWise Case Studies Compiled by WasteCap of Massachusetts	

Another successful Waste Cap program, in its third year, is the "Race to Recycle" competition. This program, targeted to building owners and managers, awards building managers in several categories (for example: most creative program award, very large building award, medium building award) for their successful efforts to incorporate recycling programs in their facilities. EOEA has also hired WasteCap and a communications/public relations consultant to develop a recycling strategy to increase recycling by businesses on Newbury Street in Boston. The Newbury street recycling project provides a cardboard recycling cooperative that any Newbury street business can use to recycle cardboard conveniently and cost effectively. In addition, the project includes a handboook to tell business how to recycle other materials, including what companies they can call, how much it will cost, and how of ten pick-up will be provided. Business that are already recycling on Newbury street, such as Ben and Jerry's, Patagonia, and the Copley Square and Lenox Hotels have saved \$1,000 to \$8,000 per year by recycling.

Through these private efforts, involvement of building management, and the expansion of non-profit efforts such as WasteCap and MassRecycle, commercial access to recycling has continued to grow. EOEA and DEP are assisting in these efforts by continuing to support WasteCap and providing technical and financial assistance to manufacturers through the Recycling Business Loan Fund which provides working capital to recycling businesses that might otherwise have difficulty obtaining loans through traditional means.

Community and Economic Development

Recycling Loan Fund Program Progress

In January 1996, DEP awarded the Massachusetts Business Development Corporation (MBDC) a 3 year contract to run a loan program aimed at providing financial assistance to small recycling businesses and raising the recycling industry's profile to the Massachusetts financial community. More than 250 bankers and economic developers have been briefed about the Loan Fund, which in mid-1996 had begun underwriting work with more than a dozen recycling-related businesses handling a diverse range of materials. The Loan Fund was capitalized to over \$1.5 million in FY97 and FY98. The Loan Fund primarily services recycling and composting related businesses, including processing capacity. The Loan Fund is intended to leverage other sources of loans. Through March 1997, eight loans have been closed totaling \$1.28 million, which has leveraged more than \$5.5 million in additional financing from the private sector and state economic development programs.

The success of the Recycling Loan Fund is already apparent. The Loan Fund was able to quickly process a loan for Winthop Steel Co. of Fitchburg which allowed them to repair a major piece of processing equipment. Safety Fund National Bank noted in connection with this loan that providing "much needed help on a timely basis to deserving businesses for special needs is difficult. I commend all involved and trust that this program has also provided needed benefits to other companies in the recycling business." Another company which has benefited from the loan fun is WTE Corp., a manufacturer of recycled plastics and ferrous metal recycling, which is undergoing significant expansion. In addition, the loan fund supported SelecTech, a start-up plastics manufacturing company, which allowed the company to leverage other financing.

Assistance to the Paper Industry

In February, 1997, DEP and the Industrial Services Program (ISP) published the results of a year long study, "Turning Wastepaper Into Jobs", intended to help the state's 38 paper mills increase their use of waste paper as raw material and to improve their competitiveness. Assisting the

paper mills will provide more stable markets for recycled paper, as well as maintain or increase jobs. Follow-up work has included briefings for the state's economic development agencies, one on one technical assistance to a number of mills, and collaboration with the Bay State Skills Corporation to develop a state-wide training program for the paper industry. ISP recently hired a full time professional dedicated to developing assistance initiatives for the state's recycling manufacturing industrial segment.

Matchmaking/Collaborative Efforts

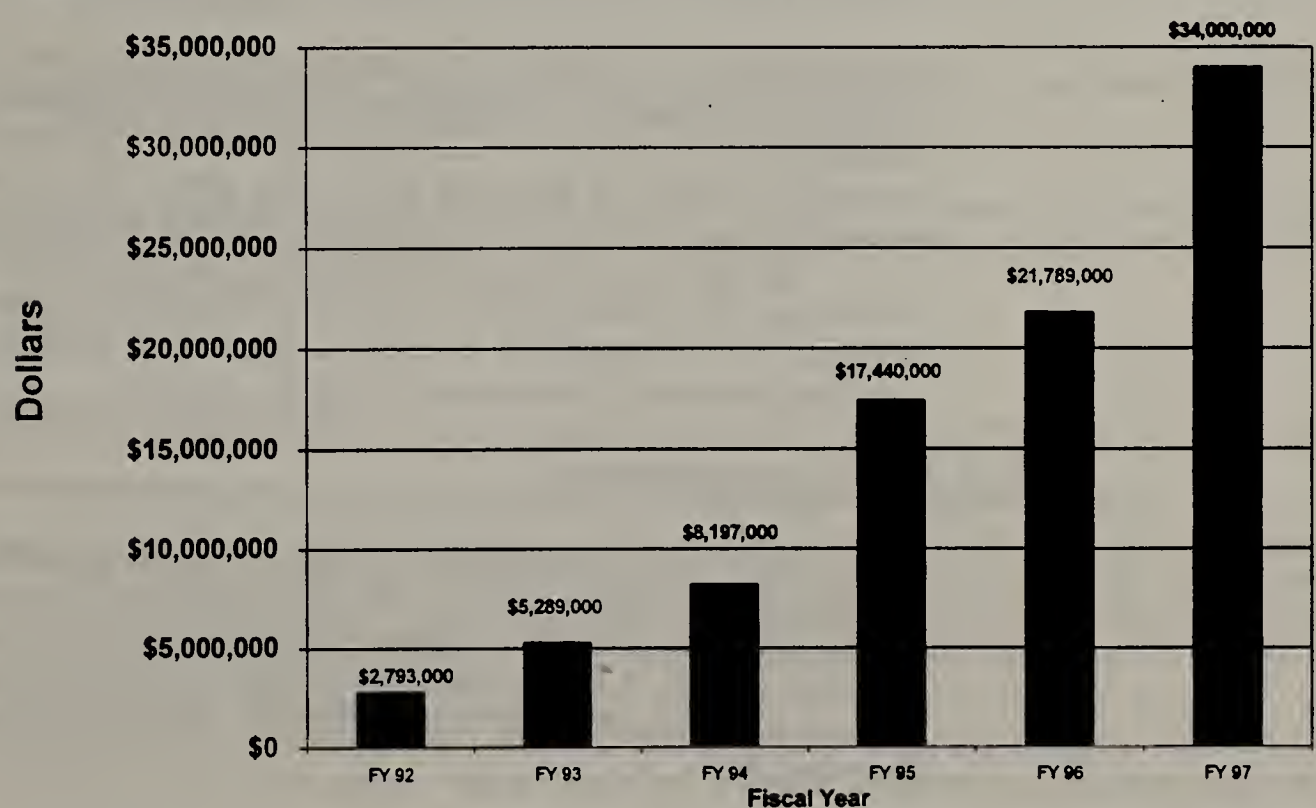
In May 1997, DEP co-sponsored the first ever, Northeast Recycling Venture Forum, in which twenty recycling businesses (including 8 from Massachusetts) presented their business plans to an audience of investors. The Boston event, was favorably received by investors and businesses. Another event co-sponsored by DEP in New York City (in May, 1997), was also well received.

More than 40 banks, utilities, and state and local economic development officials attended a one day seminar in June 1996 entitled "Fostering Economic Development Through Recycling". A collaborative effort among DEP, the Chelsea Center for Recycling and Economic Development, the Massachusetts Office of Business Development, and the Northeast Recycling Council. The seminar included development of three case studies highlighting recycling businesses and how they obtained financing, as well as a slide show profiling the recycling industry. Follow-up work will include making the slide show available to interested parties throughout the state, distribution of an economic development resource guide, and a two day training workshop for municipal recycling and economic development officials.

Recycled Purchasing Progress

The Commonwealth has made tremendous improvements in its purchases of recycled content products since 1992. Since that time, EOEA and DEP have funded two staff dedicated to environmentally preferable purchasing in the Executive Office of Administration and Finance's Operational Services Division (OSD). Staff continue to build on earlier program successes, providing assistance to many agencies and municipalities. In its FY97 annual report, OSD indicated that it has increased the state's FY96 recycled purchasing to approximately \$22 million and FY97 to \$34 million (see Figure 2-3).

Figure 2-3: Massachusetts Recycled Product Purchases



In addition to purchases of recycled content materials, several steps have been taken to make environmentally preferable purchasing a routine part of the state's procurement practices. (see **Table 2-10**) This effort has included: publication of an annual report setting goals and measuring progress; holding the second annual vendor fair for recycled products; testing new recycled-content products such as recycled paint and rerefined motor oil on a pilot basis through the Pilot Purchase Program; and creating an environmentally preferable purchasing home page on the World Wide Web. Through the Pilot Purchasing Program EOEA has provided \$120,000 to OSD to purchase and test recycled products.

TABLE 2-10: SUMMARY OF FISCAL YEAR 1997 ENVIRONMENTALLY PREFERABLE PURCHASING GOALS

Goal I	Increase Value Of Recycled Content Product Purchases to \$27 Million in FY97
Goal II	Increase Recycled Content of Current Products Purchased
Goal III	Expand Use of Other Environmental Criteria Beyond Recycled Content
Goal IV	Promote Environmental Purchasing Through Education and Training
Goal V	Improve Tracking Of Recycled Purchases/Expand Types of Measurements Used
Goal VI	Institutionalize Consideration of Environmental Criteria In All Purchasing Decisions

In addition, OSD has streamlined regulations governing procurement of commodities or services (801 CMR 21) to include a recycled procurement requirements, as well as including a new section on environmentally preferable purchasing in their Procurement Policies and Procedures Handbook. The net effect of these changes to the regulations is to broaden the scope of OSD's regulations from recycled products to include, products or services that minimize waste, conserve energy or water; or reduce the consumption and disposal of toxic chemicals. The new section to the handbook requires agencies to purchase specific environmentally preferable products such as recycled printing and writing paper, computers and copiers that meet Federal energy consumption guidelines, and creates a process which makes it easier to add new requirements when feasible. The Massachusetts Public Interest Research Group (MASSPIRG) has recognized the Commonwealth of Massachusetts program as one of the ten best buy recycled programs in the country in meeting federal content standards for paper products.

Massachusetts is also promoting the purchase of recycled products by municipalities. Through FY97 grant requirements, municipalities are required to establish a policy which promotes a preference for the purchase of recycled products in lieu of non-recycled products, whenever they are readily available at the same quality and price. The Commonwealth will consider a municipality's recycled purchases in evaluating its fiscal FY98 equipment grant application. This policy will also be a minimum requirement to qualify for the MRIP incentive payments. Furthermore, the Commonwealth has requested information on the amount of recycled products purchased by a municipality in the FY98 municipal grant application. Additional Information of Requested Purchasing Programs can be found in Chapter 1.

North Andover Landfill Closure

To investigate and promote the use of recycled materials in landfill final cap designs, DEP will specify several recycled materials in the final design plans for the North Andover, Holt Road landfill. The Commonwealth is responsible for the closure of the Holt Road landfill, which ceased operations in 1985. A landfill assessment has been completed and closure design plans have been prepared for construction of the final landfill cap. Phase one of closure construction is underway December 1997.

DEP is proposing to use several different materials in the final cap design. The plans will specify use of the following recycled materials in the closure to demonstrate their use and effectiveness for other landfill closures. Once the landfill is closed, DEP will develop suitable specifications for use (where none currently exist for the recycled materials), determine the costs of using these materials and provide this information to municipalities that will soon be capping their landfills. The recycled materials are:

- mixed-color crushed glass in the landfill gas venting layer, under the impermeable cap;
- mixed-color crushed glass in a portion of the upper drainage layer over the impermeable cap;
- mixed-color crushed glass in the landfill gas migration trench;
- chipped tires (2 inch) in the landfill gas venting layer below the impermeable cap;
- Three types of soil amendments for use in the vegetative support layer over the impermeable cap:
 - leaf compost mixed with loam;
 - Type I and II sludge mixed with loam; and
 - paper mill residuals mixed with leaf compost.

Transportation Purchasing Progress

From FY95 to FY97, EOEA has funded the University of Massachusetts research to facilitate the use of recycled materials in highway applications.

In FY96, the University of Massachusetts published the results of a EOEA/DEP funded study entitled "Use of Recycled Materials and Recycled Products in Highway Construction." This FY96 report was followed up with a second report in 1997. Following its report, EOEA/DEP funded a series of projects:

- preparation of specifications for recycled plastic lumber fence posts, several applications of recycled Portland cement concrete and background research to add other recycled products to Massachusetts Highway Department's (MHD) approved products list;
- cost studies and survey work to prepare for field testing of manufactured loam as compost materials in construction applications; and
- recommendations of uses for scrap tires
- a series of workshops held around the state to educate contractors and municipal officials about the use of recycled products in transportation applications.

In 1997, MHD purchased \$40,000 of plastic lumber tables, picnic benches for use at highway rest stops and other recycled products. In addition, MHD participated in a multi-state contract for plastic traffic cones made with 7% post-consumer content.

Business Purchasing Progress

In FY97 its first full year of operation, the Buy Recycled Business Alliance increased its membership to 130 Massachusetts businesses committed to increasing their purchases of recycled products. Three newsletters were mailed to over 450 businesses, and Alliance staff responded to more than 650 requests for information about buying recycled products. The Alliance provides several publications and services to businesses, including "Buy Recycled! A Guide for Massachusetts Businesses," "Massachusetts Directory of Recycled Product Suppliers", and product information fact sheets. Lessons learned through this early program work led to a heightened focus on: product specific technical assistance materials; vendor directories; user

testimonials; and more aggressive marketing efforts. These efforts will make a greater number of Massachusetts businesses aware of the advantages of buying recycled products.

Unit-Based Pricing Progress

The 1994 Master Plan Update first highlighted the importance of unit-pricing programs and kicked off the Commonwealth's efforts to promote these programs. During 1995, six workshops on unit-based pricing were held for municipal groups in Woburn, Westport, Northampton, Millbury, Dartmouth and at the New England Environmental Expo in Boston.

In April 1996, several dozen local and state officials participated in a video conference on variable rate unit-based pricing for municipal solid waste at the UMass Boston campus. The forum, sponsored by DEP, the Council of Northeast Governors (CONEG) and EPA provided participants with information about unit-based pricing systems for solid waste collection and disposal services. Discussions focused on: how and why variable rate pricing systems work; the benefits to the communities that adopt them;

the issues that typically arise when these systems are adopted by a municipality, and what officials can do to broaden their knowledge of unit-based pricing. A total of 173 state and local officials, recycling coordinators, and volunteers attended this and other unit-based pricing presentations in FY97.

One example of successes arising from such meetings is that on June 3, 1996 the City of Taunton began its "New Trash Sticker Rules" (see **Table 2-11**). Taunton's program resulted in part from coming to a DEP presentation on unit-based pricing, and receiving both written information and technical assistance. Their program was started with the city's own funding.

EOEA and DEP staff met with over 150 key municipal officials to answer questions on unit-based pricing at the Massachusetts Municipal Association's Annual Conference and will continue to conduct technical assistance through a combination of large conferences, smaller workshops, one-on-one discussions, and discussions with "mentors" (officials from other municipalities who currently manage unit-based pricing programs).

In January 1997, EOEA and DEP released a guidebook on unit-based pricing, titled "Pay As You Throw: An Implementation Guide for Solid Waste Unit-Based Pricing Programs." This guide was developed for municipal decision-makers and citizens to better understand unit-based pricing and to develop and implement effective programs in their communities. This guide will be mailed to all municipal chief executive officials and recycling coordinators. Additional copies of this guide are also available by contacting DEP's Joseph Lambert, at 617-574-6875.

The state is seeing increased interest in unit-based pricing. In Fall 1997, Foxboro initiated its program and Merrimac has approved a program for implementation in 1998. DEP and EOEA are also promoting unit-based pricing through the Municipal Recycling Incentive Program (MRIP) and Recycling Grant Program. Under the MRIP program, municipalities with unit-based pricing can receive incentive payments without needing to meet as many conditions as municipalities without unit-based pricing programs.

TABLE 2-11: TAUNTON UNIT-BASED PRICING PROGRAM

Program accepts normal household trash consisting of non-compostable and non-recyclable items. Each household is allowed to dispose of one large item free per week, such as a chair. The program allows:

- **Single Family units:**
No sticker needed for first container (bag or barrel). Second container must have 50 cent sticker each week.
- **Multi Family units:**
first container must be barrel with permanent sticker provided by landlord. Second container must have 50 cent sticker each week.

Unit-pricing grants, which are one component of EOEA and DEP's Core Recycling grants, assist communities with start-up costs associated with new unit-based pricing programs. The grants have provided up to \$2 per household for specially marked bags or stickers to distribute to residents, as well as distribution of free public education materials to residents explaining how a new unit-based pricing program will work. The maximum household grant has been raised to \$10 per household in FY98 and provide greater assistance and incentives for municipalities starting new unit-based pricing programs.

Springfield Materials Recovery Facility

In FY95 the Commonwealth selected a new vendor for the Springfield Materials Recovery Facility (SMRF). The contract between the vendor and DEP was a long-term contract negotiated for a 10 year period, allowing communities to have stable, sustainable recycling programs in spite of market fluctuations. The original agreement entered into by the municipalities, RRT, and the Commonwealth, called for payment of a \$20/ton floor price to communities which deliver all recyclables they collect to the SMRF. In just over 11 months since the revised community agreement took effect, the SMRF has had 80 communities which signed contracts for over \$700,000 in payments. In 1997, municipalities were offered a contract extension through which they would be able to receive lower payments spread over a longer period of time. The SMRF processed 52,000 tons of recyclables during 1996.

Recycling Education Assistance for Public Schools (REAPS)

Nearly 40% of Massachusetts public schools have now implemented waste diversion programs. The Recycling Education Assistance for Public Schools (REAPS) Program began in FY95 with a goal of not only setting up school recycling programs but also increasing the awareness of the importance of recycling among public school students in grades K-12. Objectives of the program are to deliver classroom presentations, teacher training sessions, and technical assistance for waste diversion programs in public schools. The program expanded objectives in FY96 to also incorporate training of municipal recycling coordinators to set up waste diversion programs in schools. The accomplishments of the program are summarized in **Table 2-12**.

TABLE 2-12: SUMMARY OF 1995 REAPS PROGRAM ACCOMPLISHMENTS		
	FY95	FY96
Classroom Presentations	106	275
Teacher Training Sessions	6	15
Technical Assistance Sessions	26	55
Students Reached	26,000	30,000
Tons Recycled	150	330

The King County Solid Waste Management District (King County, WA) recently calculated that the average public school student generates 240 lbs. of solid waste during the course of a school year. Applied to Massachusetts' 916,000 public school students this would result in generation of approximately 110,000 tons of solid waste per year. By setting up recycling programs in over 125 schools, the REAPS Program helped to divert 150 tons of white paper from the school waste stream in FY95, 330 tons in FY96, and 515 tons in FY97.

The REAPS Program assisted school recycling programs in several municipalities which transitioned from drop-off to curbside recycling services. Among these communities are Saugus, Brockton, Rockland, Lawrence and Danvers. The program also helped to train over 35 municipal recycling coordinators to set up recycling programs in their towns' schools

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Chapter 3: Generation and Management of Solid Waste 1995 and 1996

Introduction

This chapter presents a comprehensive picture of the generation and management of solid waste in Massachusetts during 1995/1996 and compares that information with the generation and management of solid waste in prior years. This chapter focuses primarily on 1996, and changes from previous years and includes data for 1995 which has not been presented in prior Master Plan Updates.

In summary, generation of municipal solid waste (MSW) in 1996 was higher than it was in 1994. Residential generation of MSW rose from 1994 to 1995 and remained at the same level for 1996. Commercial generation dipped considerably in 1995 and increased again in 1996. Composting and recycling of MSW as a proportion of MSW generation increased 1% per year since 1994, rising to 32% in 1995 and 33% in 1996.

Total waste generation increased each year from 1994 through 1996 due primarily to increases in commercial MSW and non-MSW and partly due to better data reporting. Diversion of non-MSW to processing and recycling rose significantly from 1994 to 1995, but remained steady from 1995 to 1996.

The data reported in this Update has been modified from that presented in previous drafts. In response to issues raised by the Data Group, the chart was modified to include:

- increased exports and imports;
- increased waste generation due primarily to increased exports;
- increased commercial recycling as a result of previously uncounted materials; and
- modified landfill and combustion facility disposal numbers as a result of receiving additional and updated Annual Facility Reports.

Table 3-1 The Integrated Solid Waste Management System (1994-1996)

	1994	1995	1996
Total Generation	9,710,000	10,780,000	11,600,000
Exports	426,000	470,000	824,000
MSW	7,050,000	8,780,000	7,330,000
Residential	2,870,000	3,130,000	3,280,000
Commercial	4,180,000	3,630,000	4,050,000
Non-MSW	2,660,000	4,020,000	4,270,000
C&D	2,420,000	3,760,000	4,010,000
Biosolids	90,000	50,000	70,000
Other	150,000	210,000	190,000
Total Management	10,800,000	10,760,000	11,430,000
Imports	796,000	450,000	652,000
Diversion	4,060,000	5,040,000	5,310,000
MSW	2,160,000	2,140,000	2,410,000
Residential Recycling	420,000	460,000	470,000
Commercial Recycling	1,070,000	1,010,000	1,270,000
Residential Composting	440,000	440,000	440,000
Commercial Composting	230,000	230,000	230,000
Non-MSW	1,900,000	2,900,000	2,900,000
C&D	1,900,000	2,900,000	2,900,000
Disposal	6,020,000	5,720,000	6,120,000
Landfill	2,680,000	2,510,000	2,830,000
MSW	1,900,000	1,540,000	1,620,000
C&D	550,000	700,000	900,000
Biosolids	90,000	60,000	70,000
Other	140,000	210,000	230,000
Combustion	3,340,000	3,210,000	3,290,000
MSW	3,320,000	3,190,000	3,250,000
Non-MSW	20,000	20,000	40,000

Figure 3-1: Total Solid Waste Generation, 1995¹

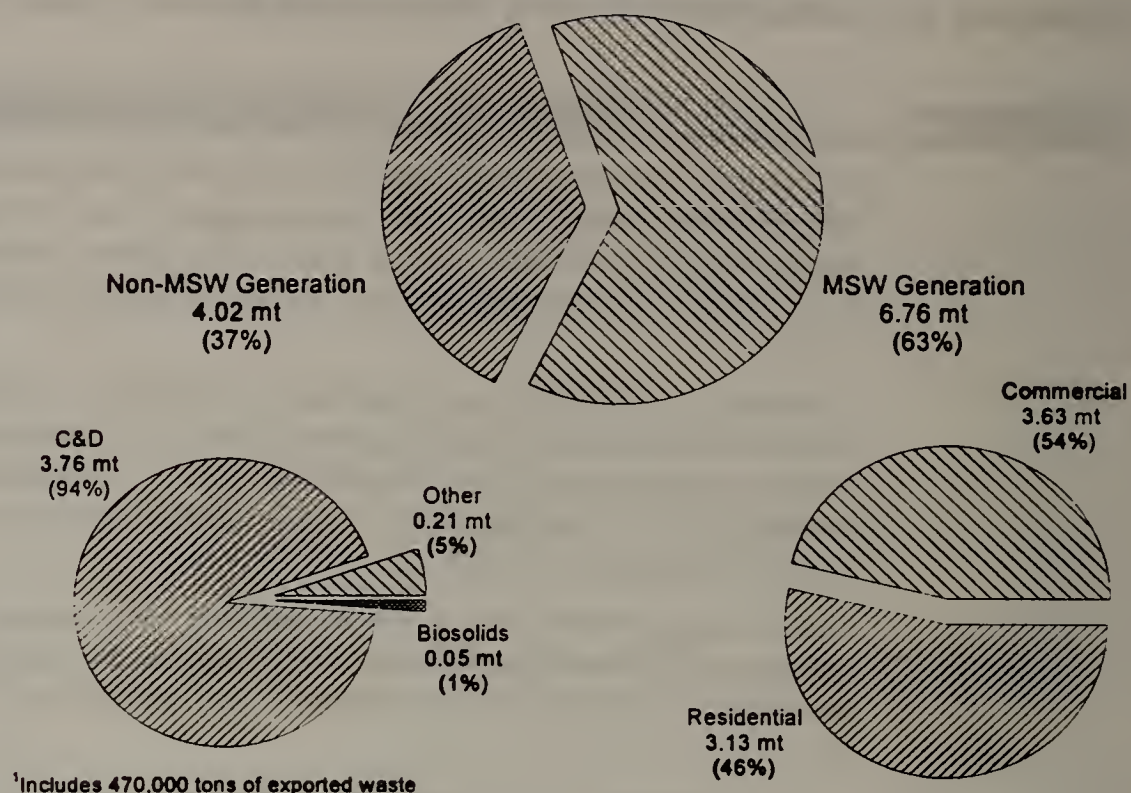
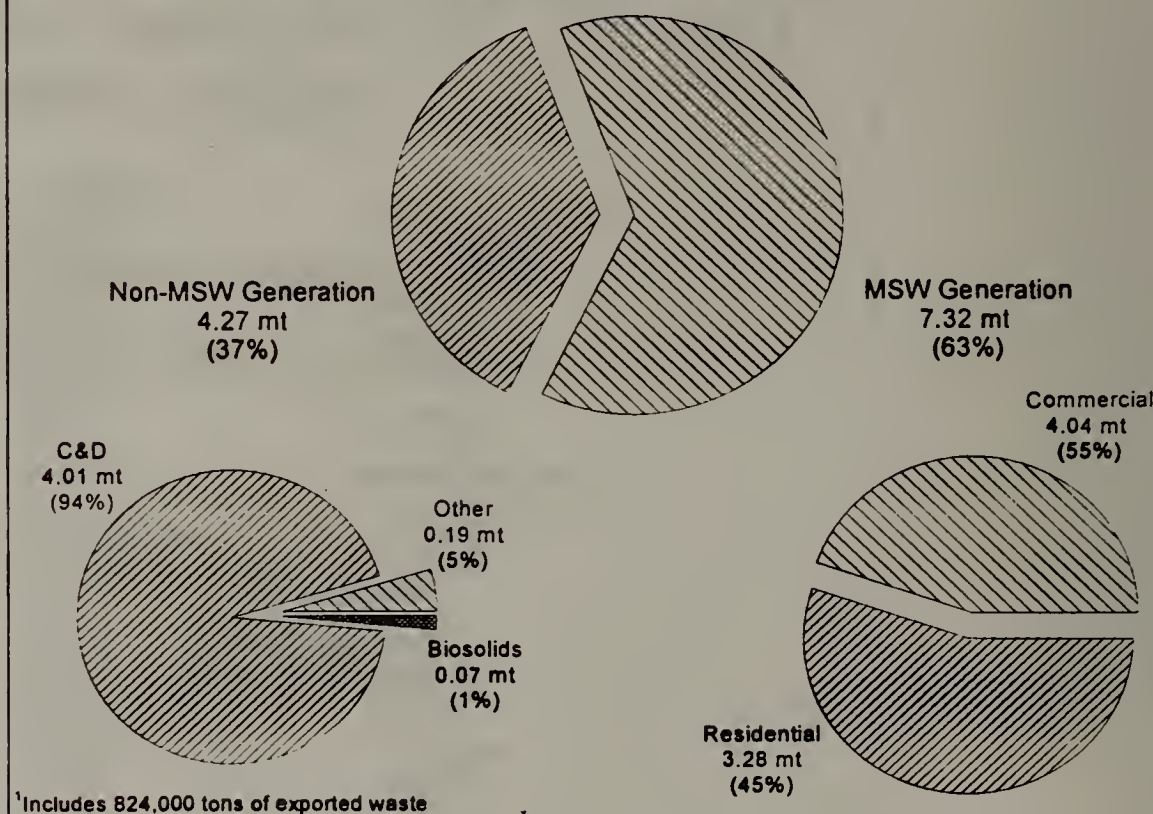


Figure 3-2: Total Solid Waste Generation, 1996¹



The presentation of data for waste generation and management in 1995 and 1996 reflects a balance between the generation of waste and the management of that waste, taking into account imports and exports of solid waste. The discussion that follows presents each element of the system. This "balance sheet" approach is presented in **Table 3-1** for 1994-1996.

This Update reflects some improvements in methodologies from previous plans. In the 1995 Master Plan Update, non-MSW processing and total MSW recycling were estimated based on surveys that were at least one year old. To generate the information for this years Update, both surveys were repeated. In addition, starting with 1995, transfer stations were included in annual solid waste management facility reporting. This has allowed for more accurate accounting of solid waste management and the movement of solid waste, particularly for tracking imports and exports of solid waste into and out of Massachusetts.

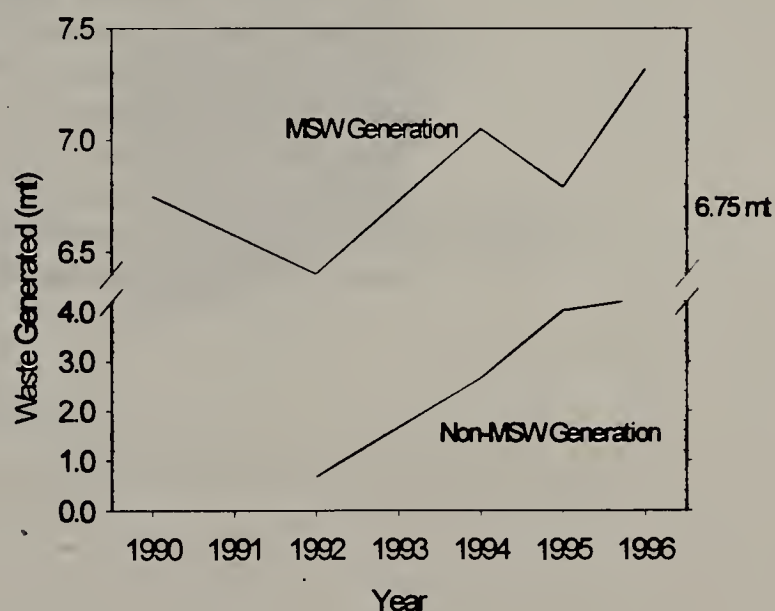
Figures 3-1 and 3-2 present a breakdown of the generation of solid waste in the state in 1995 and 1996. Total solid waste (MSW plus non-MSW) generated in Massachusetts has increased from 9.71 million tons (mt) in 1994 to 11.60 mt in 1996. In 1996, this waste consisted of 7.33 mt of MSW, and 4.27 mt of non-MSW (including 824,000 tons of mixed MSW and non-MSW exported out of state for disposal). Total solid waste generation in 1996 was 1.9 mt greater than in 1994, the first year that non-MSW generation was estimated. This increase is due primarily to increases in commercial MSW and non-MSW (which increased from 2.66 mt in 1994 to 4.27 mt in 1996) and partly due to better tracking of Construction and demolition (C&D) waste since 1994.

The 1995 Update discussed the potential for variability in non-MSW generation, suggesting that this variability is a reflection of the general economy and the amount of construction activity in the state. This variability makes it difficult to predict future non-MSW generation rates. We can anticipate that generation of non-MSW will vary in the future. The projections presented in the next chapter discuss our planning approach to account for the anticipated variability in C&D generation and processing rates.

Municipal Solid Waste

MSW generated within the Commonwealth consists of durable and non-durable goods, containers, packaging, food waste, yard waste, and other organic material from homes (residential waste) and similar wastes from businesses and institutions (commercial waste). The generation of MSW has varied from 7.05 mt in 1994, dropping in 1995 to 6.76 mt and then rising to 7.33 mt in 1996 (**Figure 3-3**). Over that period, the residential portion of MSW has steadily increased from 2.87 mt in 1994 to 3.28 mt in 1996, while the commercial portion has varied from 4.18 mt in 1994 to 3.63 mt in 1995 to 4.05 mt in 1996. The increase in residential waste from 1994 to 1996 is 14%, while the

Figure 3-3: MSW and Non-MSW Generation 1990-1996



decrease in commercial waste generated from 1994 to 1996 is 3%.

Increases in residential generation likely resulted from the continuing expansion of the economy and attendant increases in consumer confidence and purchasing, as well as increases in population. On the commercial side, possible rationales for the reduction in commercial waste generation in since 1994 include source reduction efforts on the part of businesses, reductions in employees as a result of mergers and downsizing, or further movement towards the paperless office through expanding use of electronic communication and record keeping. Examples of source reduction efforts by businesses which have resulted in lower generation of solid waste are included in Chapter 2.

The 1990 Master Plan projected MSW generation would remain flat at 6.75 mt for the period 1990-2000 due to source reduction efforts (see **Figure 3-3**). It is clear from the past several years of data that MSW generation fluctuates. While waste generation in 1995 was at the planning projection, both 1994 and 1996 were above the projected generation rate. Waste generation is likely to continue to fluctuate due to a variety of factors including economic conditions, population growth and the impact of source reduction by manufacturers and consumers.

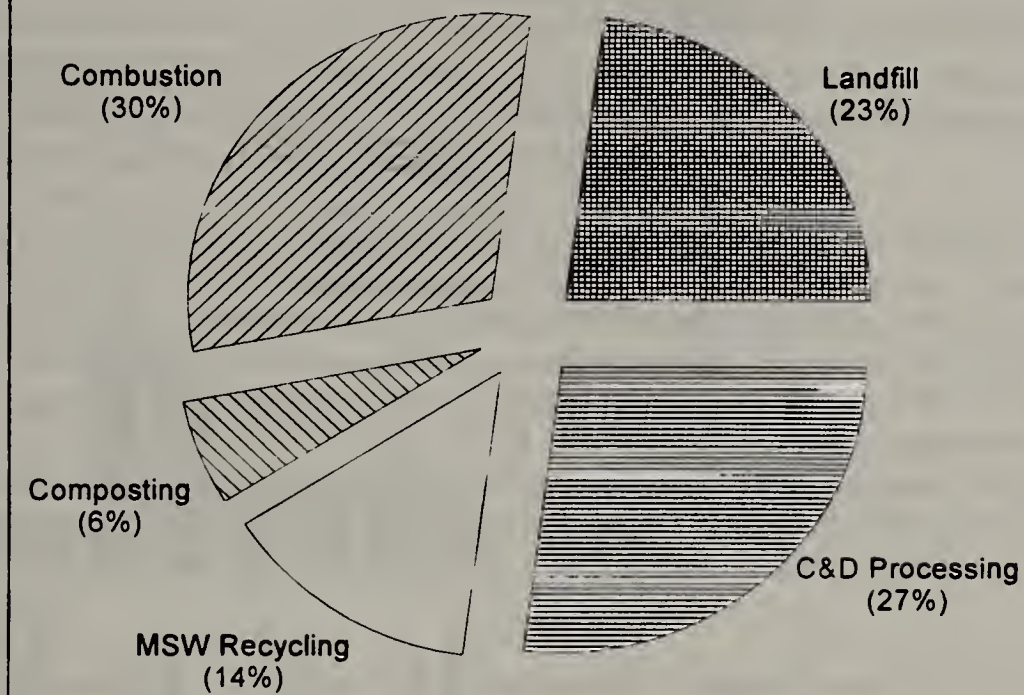
Non Municipal Solid Waste

Non-MSW generation for 1995 was 4.02 mt. and for 1996 was 4.27 mt. Non-MSW consists of all solid waste materials not classified as MSW and includes, for example, wastewater treatment facility sludges, non-hazardous industrial solid wastes, street sweepings, and construction and demolition waste. Construction and demolition waste (C&D) dominates the non-MSW category, making up 94% of the non-MSW generated, with smaller amounts of wastewater treatment facility sludge (only to the extent that the sludges are co-disposed with MSW), recycling residuals, contaminated soils, and other wastes that may include industrial solid wastes. C&D waste is comprised of debris generated from construction, renovation, repair, and demolition of roads, bridges, and buildings and includes wood, steel, concrete, masonry, plaster, metal, and asphalt, but not wood from land-clearing, i.e. stumps, logs, brush, and soil, nor rock from excavations.

Waste Management

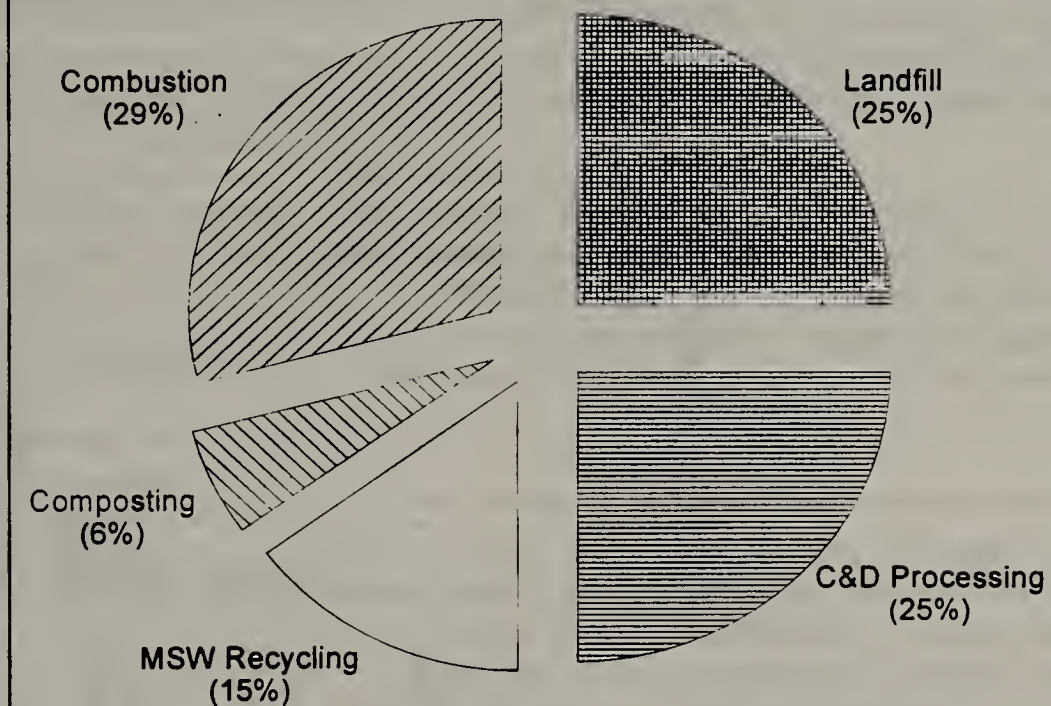
The integrated solid waste management system is comprised of both recycling facilities and disposal facilities. **Figures 3-4** and **3-5** present details on how waste was managed in 1995 and 1996. Altogether during 1995, facilities within the Commonwealth managed 10.78 mt of waste, including 450,000 tons of waste imported from out-of-state (versus 470,000 tons exported) for disposal in Massachusetts facilities. During 1996, facilities managed 11.60 mt, including 652,000 tons of imported waste (versus 824,000 tons exported). In contrast to prior years, Massachusetts was a net exporter of 20,000 tons in 1995, and 172,000 tons in 1996. Most of the waste exported from Massachusetts is disposed at Waste Management's landfill in Rochester, NH and comes primarily from the City of Boston, which has recently re-contracted part of its waste collection program with Waste Management, while imported waste is generally commercial waste entering the state on the spot market. The amount of material managed in 1996 and previous years is provided in more detail in **Figures 3-6** and **3-7**.

Figure 3-4: Total Solid Waste Management, 1995¹



¹Includes 450,000 tons of imported waste

Figure 3-5: Total Solid Waste Management, 1996¹



¹Includes 652,000 tons of imported waste

Figure 3-6: MSW Management (1992, 1994-1996)

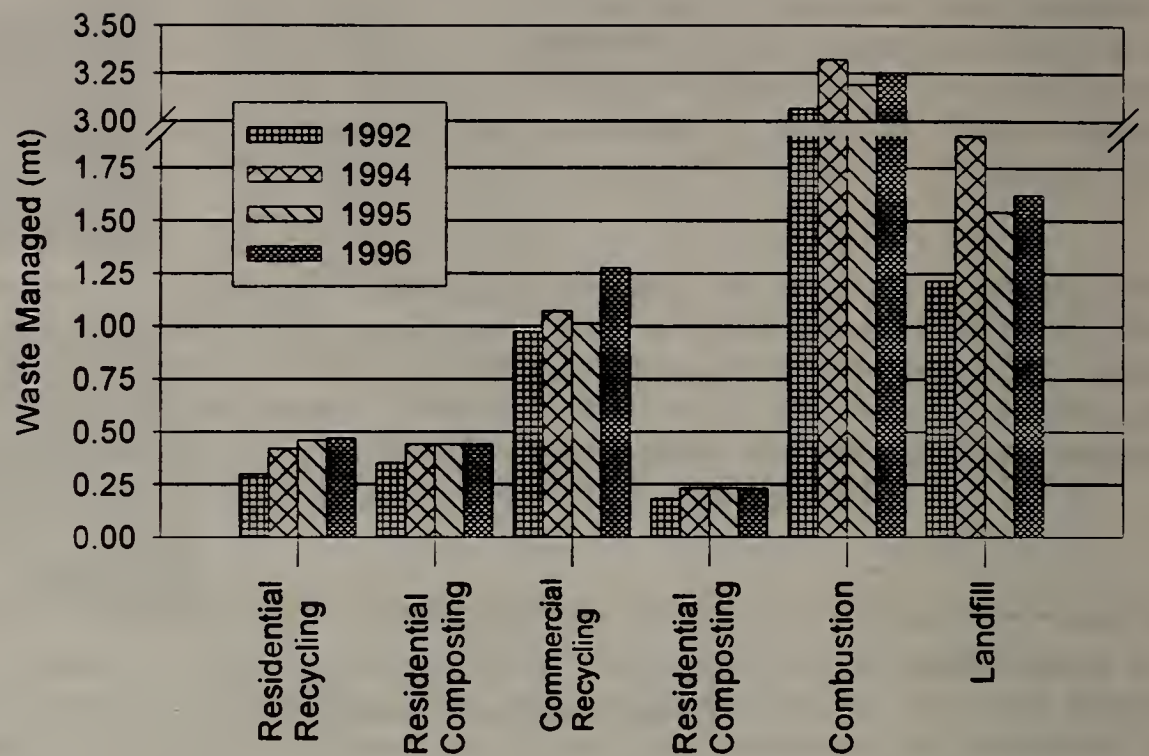
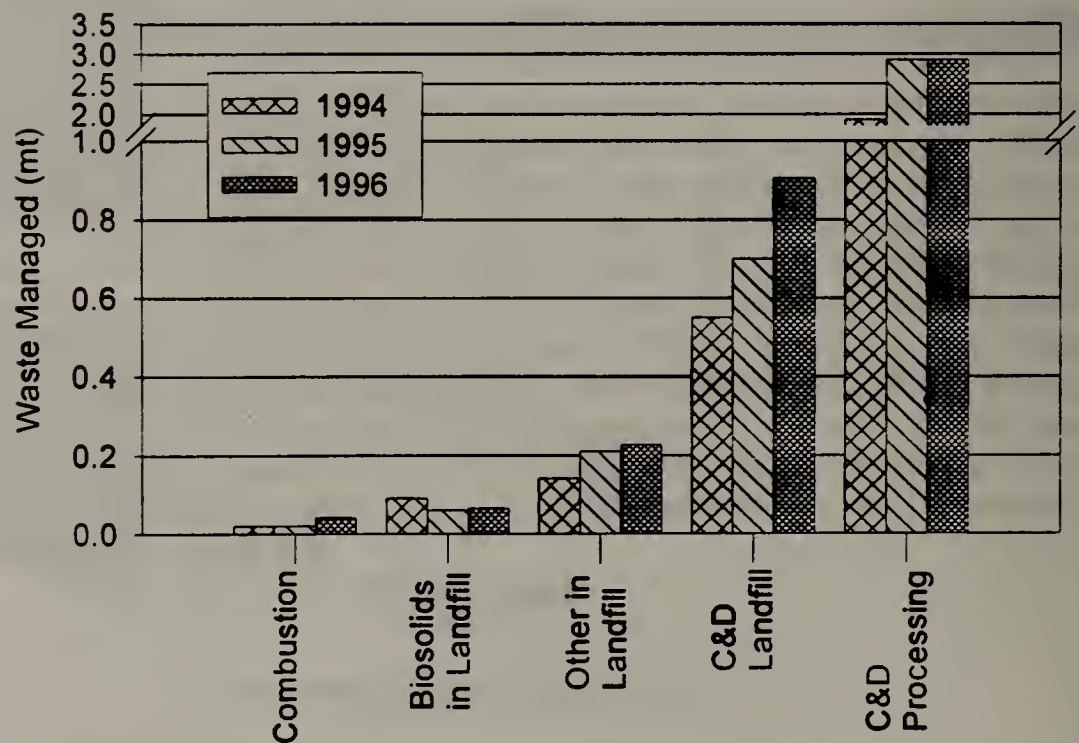


Figure 3-7: Non-MSW Management (1994-1996)



Waste Diversion

The total quantity of waste diverted continued to increase from 4.06 mt in 1994 to 5.04 mt in 1995 and 5.31 mt in 1996 (see **Table 3-1**). These diversion totals represent total system diversion rates of 42% in 1994, and 47% for both 1995 and 1996.

For MSW, total diversion increased from 2.14 mt (32% of generation) in 1995 to 2.41 mt (33% of generation) in 1996. Both years show an increase from 1994. Within the residential portion of MSW diversion, 6% more MSW was diverted in 1996 when compared to 1994. On the commercial side, the total quantity of MSW recycled and composted rose 13% from 1994 to 1996. While the total amount of MSW recycled in 1996 was substantially greater than in 1994, the actual recycling rate only rose 2% over the two year period due to increased waste generation. Furthermore, recycling rate increases were slowed by the drop in prices for recycled paper, which makes up the largest percentage of recycled materials. It is expected that when paper markets improve and impacts of other state supported recycling initiatives are realized, recycling rates will show improvement.

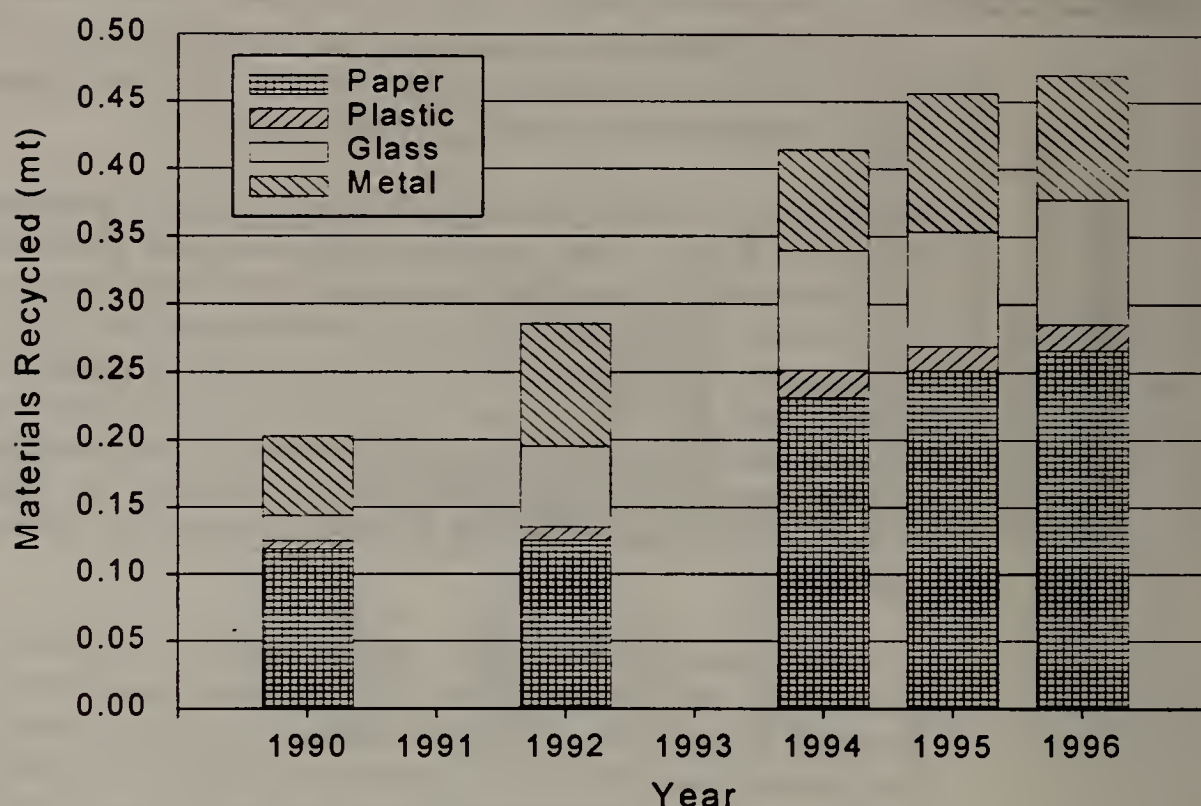
It should be noted that some wastes which are generally considered part of the MSW waste stream such as tires, (which are less than 1% of the waste stream) have not been included in diversion estimates. These estimates only include glass, metal, paper, plastic and a small amount of textiles. For example, waste tires are only counted as MSW to the extent that they are disposed in solid waste disposal facilities because, in general, tires are handled by a separate system of tire collectors, transporters, processors and end-users. A significant quantity of waste tires are chipped for use as tire derived fuel (TDF) in paper mills in Maine and elsewhere and therefore are diverted from disposal in solid waste facilities, but by non-recycling applications. Furthermore, the amount of tires recycled, either through re-capping or some other means, has not been included in the MSW waste diversion estimates in this report. Other waste materials are reused in many different ways in Massachusetts but which are currently not counted toward either the generation rate or the recycling rate. These materials include waste materials which have received Beneficial Use Determinations (BUDs) from DEP for uses ranging from use in asphalt pavement, use as fill material or daily cover at landfills, to combustion in utility boilers.

DEP is considering including additional items, such as tires, in the recycling rate calculations in future Master Plan Updates and will discuss these options with the Data Group. DEP will also consider how to obtain reliable data on disposal and recycling of tires, computers, and other materials managed outside the traditional solid waste systems. In addition, the agency will work with EPA on it's standard recycling methodology that is being tested in Northeast states.

MSW-Residential Diversion

Residential recycling includes residential glass, metal, paper, plastic, and textiles diverted from disposal to recycling. Residential recyclables are collected either through curbside programs, through recycling drop-off centers or transfer stations, 460,000 tons of residential wastes were recycled state-wide in 1995. This was an increase of more than 8 percent over the amount diverted in 1994 (Figure 3-8), while in 1996 470,000 tons were recycled. The recycling of this material eliminated the need for one, 1500 ton per day landfill.

Figure 3-8: MSW Residential Recycling (1990-1996)



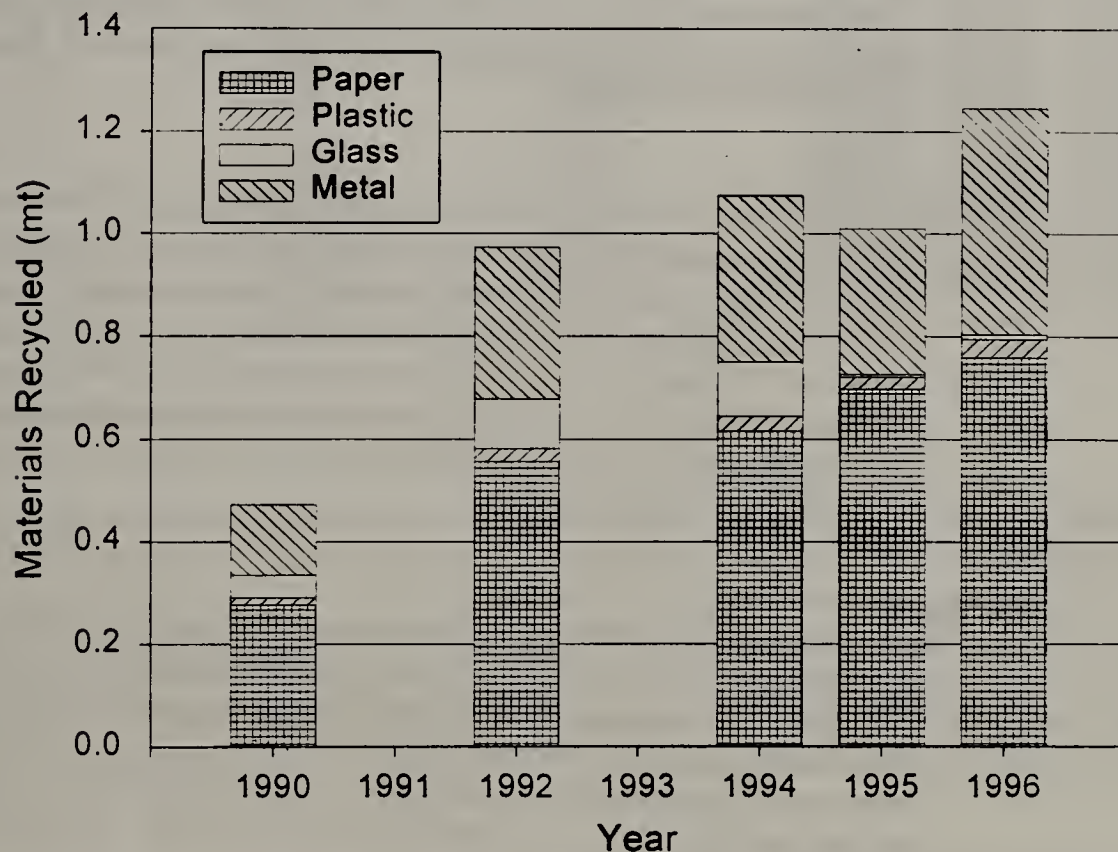
Access to recycling services for a broad range of materials is fast becoming the norm for residents who are provided with municipal waste management services. Approximately 1.4 million more Massachusetts residents have access to curbside recycling today than they did in 1994. In 1995 nearly 69%, or 4.3 million residents, had curbside pickup of some or all of their recyclables, while in 1996 this had increased to 74% of the population. This was due in part to the addition of curbside programs in Bellingham, Gardner, Lynn, and Topsfield. In 1997, new curbside programs are expected to begin in Dracut, Plymouth, West Newbury, and, Westwood. Fall River will also be expanding their existing pilot curbside program.

Residential composting consists of the diversion of residential MSW to municipal composting programs. In 1995 and 1996, an estimated 440,000 tons of material consisting primarily of leaf and yard waste, were diverted each year to municipal composting operations, saving an additional 1500 tons per day from being disposed in combustion facilities or landfills. Residential composting handled 6.5% of MSW in 1995 and 6.1% in 1996.

Significant quantities of MSW were also diverted to home composting, which remains a significant source reduction method. Several municipal bin distribution programs in Massachusetts have demonstrated that 10% of households will readily purchase home composting bins, which DEP provides through its Recycling Grants Program. A telephone survey conducted for DEP in 1993 indicated that 28% of Massachusetts households compost at least some of their organic waste. The Department estimates that as much as 15,400 tons of materials may be diverted each year in home compost bins distributed by the Recycling Grants Program.

Commercial recycling of MSW includes the diversion of commercially generated waste paper, office paper, metal, glass, and plastics. Also included are metals recovered both before and after the combustion of solid waste at combustion facilities. In 1995, commercial recycling of MSW was estimated at 1.01 mt, approximately 31% of commercial waste generation (see **Figure 3-9**). The total tonnage diverted decreased by 6% when compared to 1994, but at the same time the total tonnage of commercial waste generated decreased by 13%. In 1996 commercial recycling was estimated at 1.27 mt, amounting to 31% of commercial waste generation.

Figure 3-9: MSW Commercial Recycling (1990-1996)



Commercial composting involves the diversion of organic wastes generated or handled by the commercial sector, primarily leaf and yard waste, but also other commercially generated organic materials such as gelatin waste or food processing wastes from industry and waste vegetables from food markets. In 1995 and 1996, an estimated 230,000 tons of solid wastes were composted at commercial composting facilities.

Some commercial organics are handled at farms which compost these materials with typical agricultural wastes such as manure. While agricultural wastes are not included in the state's waste management analysis because these materials have typically not been managed by the solid waste management system, the commercial organics are tracked because they were formally disposed of at landfills. The number of registered farm composting operations and commercial composting facilities remained at 62 in 1996. A large share of the wastes composted by these operations came from non-farm sources including food processors and distributors, and paper manufacturers.

Non-MSW Diversion

The total non-MSW recycled in 1995 and 1996 was estimated at 2.9 mt, consisting entirely of C&D debris. The non-MSW diversion rate in 1996 decreased to 60%. Most of the material processed consisted of asphalt road pavement and concrete. A small portion, by weight, was wood chipped for mulch or for landfill cover. This non-MSW was processed and recycled by 55 C&D waste processing facilities in the state. While not included in the diversion data since it came on line in 1997, a new C&D waste processor has started up operations in Rochester, handling mixed C&D waste materials. This new facility will be included in the 1997 data when reported in 1998.

Currently no biosolids are co-composted with solid waste at solid waste composting facilities. While not tracked for the Solid Waste Master Plan, some biosolids are beneficially used at sludge-only compost facilities regulated by the Bureau of Resource Protection at DEP, or are directly applied to land as fertilizer.

Waste Disposal

The Commonwealth regards waste disposal as the least preferred management option for solid waste, but one which is essential for those materials which cannot be recycled or composted. Combustion facilities and landfills are the two options employed in the state for disposing of solid waste not diverted for recycling or composting. In 1996, combustion facilities and landfills combined accounted for 53 % of all the waste managed within the state and approximately 67% of the MSW portion of the waste stream managed in the state. Of this amount, approximately 2/3 was combusted a 1/3 was landfilled.

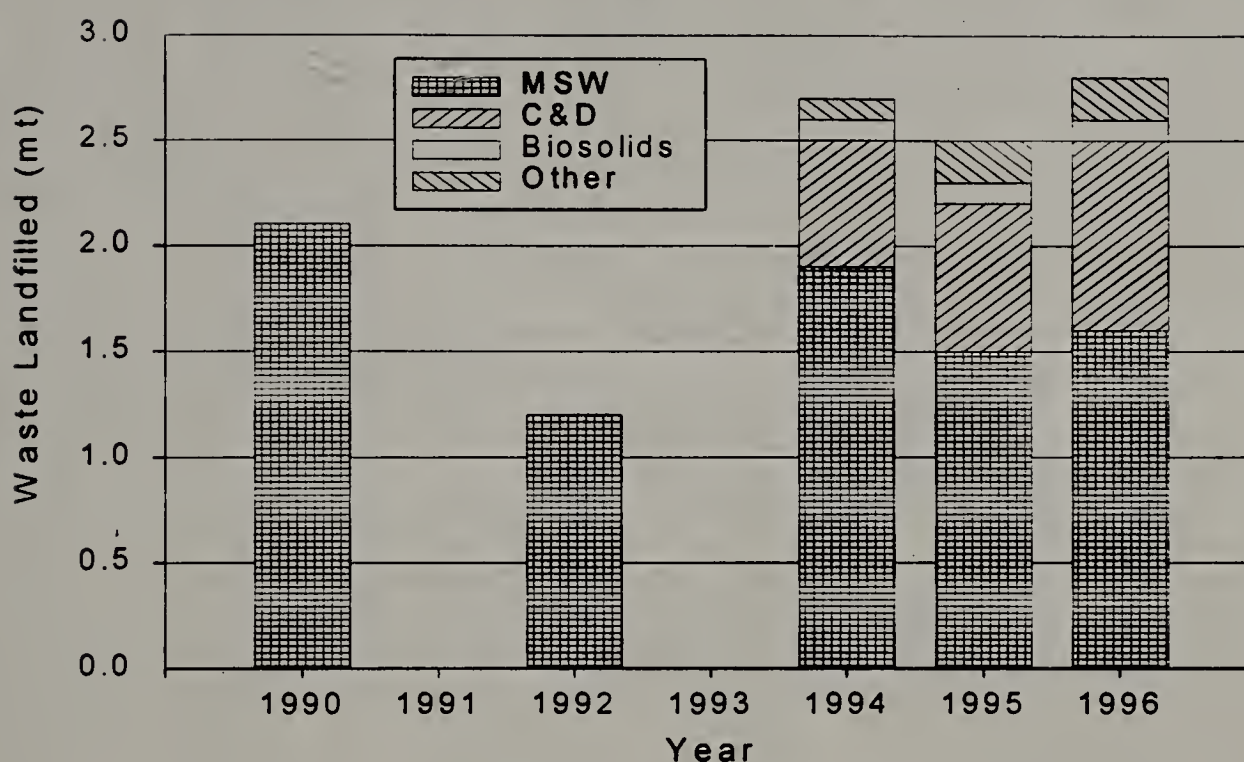
Combustion

There are nine solid waste combustion facilities operating in the Commonwealth. Of these nine facilities, six use mass-burn technology to recover energy from waste; two use waste that has been shredded for refuse-derived fuel (RDF) before burning to recover energy; and one, a municipal incinerator, does not recover energy. As seen in Table 3-1, solid waste combustion facilities reported receiving 3.21 mt in 1995 and 3.29 mt in 1996. In 1996, combustion facilities disposed of 44% of the MSW generated within the state.

Landfilling

Landfills reported disposing of 2.51 mt of solid waste in 1995 and 2.83 mt in 1996, compared to 2.68 mt in 1994. Landfilled waste in 1996 included 1.62 mt of MSW, 900,000 tons of C&D waste, 70,000 tons of biosolids co-disposed with MSW, and 230,000 tons of other wastes. Landfills disposed of 22% of the MSW within the state. MSW landfill disposal from 1990 through 1996 is presented in **Figure 3-10**.

Figure 3-10: Waste Landfilled (1990-1996)¹



The number of operating landfills and permitted landfill capacity will continue to decrease over the next three years as 73 landfills operating in 1997 will decrease to 11 in 2000 (see Chapter 4, Figure 4-2; data on the projections for individual facilities is presented in Appendix H). In 1995, 11 unlined municipal landfills closed, 9 of those pursuant to consent orders with DEP, while three commercial landfills closed upon exhausting their permitted disposal capacity. 24 consent orders were signed in 1995 for the closure of other active unlined landfills during the next three years. 16 unlined municipal landfills closed in 1996, 15 of those pursuant to consent orders, while 29 more consent orders were signed for closure of unlined landfills.

Difficult to Manage Waste

Tires

Waste tires are a solid waste and represent a threat to public health, safety and the environment when stockpiled due to the potential for fires and because they serve as breeding areas for disease-bearing mosquitoes. The potential for increased mosquito-borne disease can become a particular concern during outbreaks of equine encephalitis.

Tires are both bulky and ubiquitous across the Commonwealth; further more, they require special processing to be effectively prepared for reuse as tire derived fuel(TDF), to be recycled, or to be properly disposed. Thus, tires are both difficult and expensive to dispose of and to recycle. The question of how to properly manage tires will not disappear because the demand for new tires is continuous so the need to dispose of scrap tires is constant. Finally, tires comprise at least 1% of the MSW by weight. For these reasons, tire management is an important issue.

Quantifying the number of tires for disposal is a standard starting point in developing management strategies. Based upon the application of national sales data to Massachusetts, which indicates that fewer tires are being generated on an annual basis than previously thought, DEP estimates that

approximately 4.2 million tires were generated in 1994, the only year to which the methodology has been applied.

The next step in developing an effective management strategy is to quantify the size of current stockpiles of tires within the state. Current estimates suggest that between 7 and 10 million tires are currently in stockpiles around the state. In the past several years at least five moderately large fires have started in stockpiles across the country, including fires in Ilwaco and Garfield counties in Washington, Glenn Wood Canyon, Colorado, one in Arizona and an arson fire in Pennsylvania. Tire fires can levy serious environmental damage--releasing pollutants into the air, water, and land. In addition to air emissions, fires create an oily run-off that can pollute soil and water resources. Once ignited, the fires are difficult to extinguish and can burn virtually unabated for many months. Often these properties become hazardous waste sites. According to several studies, extinguishing and cleaning up tire pile fires costs roughly 10 times more than simply taking preventive abatement action before a fire occurs. The Department is actively working to clean up these tire piles through enforcement and in some cases by financing cleanup of a site.

Tire Management Techniques

As with most types of solid waste, tires can either be recycled, reused, or disposed. However, in the case of tires, none of these options are easy or cheap. Many of the same physical properties that make tires useful and safe products render them much more expensive to handle, process, and dispose--namely, their resistance to mechanical wear, heat, light and solvent degradation, and their bulkiness.

Disposal

Disposal options are limited to landfilling, incineration at a MSW facility or combustion as a substitute fuel for energy recovery. When buried, tires take up considerable space, decompose extremely slowly, and exhibit a tendency to rise to the top--thus ruining landfill caps. As a consequence, many states have banned tires from landfills--either forbidding them outright or only allowing burial if a tire is cut into several pieces. The Massachusetts Solid Waste Regulations ban the disposal of whole tires in landfills.

Depending on design and permit limitations, many combustion facilities that burn municipal solid waste either refuse to accept tires or accept them only whole or shredded. However, currently, there are two combustion facilities in the United States dedicated to burning only whole-tires, which generate energy. One is located in California and the other in Connecticut, both owned and operated by the same company (Oxford Energy). The Connecticut facility takes a significant number of tires from Massachusetts; but it has experienced environmental problems and was temporarily closed by the state because of emissions violations.

Tires may also be used as a supplemental fuel in industrial boilers. Nationally, using tires as a fuel source (TDF) consumes the largest percentage of tires--roughly 40% of the total. Tires have been used to supplement fossil and biomass fuels in cement kilns, pulp and paper mills, utility boilers, industrial boilers in addition to dedicated tire-to energy facilities.

TDF is popular because tires offer a significantly higher BTU value than coal (12,000-16,000 BTU/lb versus 11,000-13,000). In addition, tires contain a much lower percentage of moisture by weight than all other fuels except oil. At present, there are few alternatives to using for old, abandoned scrap tires other than for combustion because the tires are contaminated and dirty--making them much more expensive or unsuitable for further processing. Many processors in Massachusetts send tires to be used as fuel at Maine papermills or other out-of-state facilities.

Recently, DEP granted a Beneficial Use Determination (BUD) to the New England Power Company (NEPCO) to burn TDF derived from newly generated waste tires at its Salem Power Station. NEPCO's research concluded that TDF could be beneficially used as a fuel substitute for up to 9% of the coal currently burned with no impact to air emissions. This in-state use could consume as many as one million newly generated waste tires/year but won't commence until mid 1998. While use of TDF is viable at this particular facility, use at other coal burning facilities may be limited by the fuel feed systems at those plants.

Tire Recycling and Reuse

Tire recycling includes reuse in the form of retreaded tires, some civil engineering uses, or product manufacturing that produces rubber-containing products.

Retreads

Retreaders create their products by buffing the tread off a used tire to reveal the tire casing, which is the basic inner tire structure. By vulcanization, new tread rubber and sometimes sidewall rubber is then added to the casing.

Retreads are widely used in aircraft (70-80%), school buses, government and commercial fleets, fire trucks and a large percentage of trucks and heavy-equipment vehicles (where they account for 60% of the resale market). Truck tire casings are both high in quality and purchase price; so it makes economic and technological sense to retread them. Purchase of a retreaded truck tire yields cost savings of 30-50%. Safety and performance standards are high as evidenced by the fact that they are employed by most major airlines.

Passenger tires present a far different picture. Although they make up the majority of all tires sold, sales of retreaded passenger tires have decreased for years. Due to the lower quality of the tire casings, they do not yield the same economic and technological advantages as trucks. However, with proper incentives, marketing and tire maintenance, retreaded passenger car tires could represent a golden opportunity to source reduce the volume of scrap tires. To this end, DEP is working with the Operational Services Division (OSD) to establish a statewide contract for the purchase of retreaded tires by state and municipal agencies.

Recycling Old Tires Into New

For the most part, tires have not been recycled into new tires--unlike other recyclable products like glass, aluminum, or paper. The reason often cited is that the chemical properties of tires make them difficult to use. Crumb rubber is relatively chemically inert and difficult to process. Recently, Ford Motor Company's Board of Directors mandated the company use post-consumer recycled material wherever it can do so without sacrificing performance or increasing costs. As a result Ford has spurred Michelin Tire Company to adopt a program to incorporate 10% crumb rubber into new car tires. Using very fine, metal free crumb rubber, Michelin has been able to meet the 10% target without sacrificing performance, tire durability, or costs. The current goal is to have tires with 10% recycled crumb rubber content commercially available for the 1998 or 1999 Ford model year. However, Michelin is investigating the possibility of incorporating as much as 20-25% crumb rubber in passenger tires as a future goal.

Although most tire production is concentrated in the midwest and the south--use of crumb rubber in making new tires may indirectly increase national demand for crumb rubber and translate into higher demand for crumb rubber from Massachusetts..

Other Types of Tire Recycling

Tires can also be recycled in the following ways:

- direct-stamped
- chipped for civil engineering purposes
- crumbed to make rubber-containing products

There is a small but stable market for products which are simply cut from the tread without much further processing. Examples include: marine dock and boat bumpers, and rubber mats which are "stamped out" of the flattened tread. This requires a relatively low level of processing compared to chipping or crumbing. Several small processors in Mass. produce such products.

Chipped or shredded tires are generally sized 1 inch or greater and can be used in civil engineering projects to replace conventional fill and drainage materials in roadways or landfills and underwater reefs. In California, Wisconsin and Maine, for example, tire shreds have been used as fill for retaining walls and bridge abutments, insulation to prevent frost penetration, septic leach fields, and alternative daily cover at landfills. A series of fires, widely reported in the press, led to a temporary slowdown in civil engineering applications until the causes could be pinpointed. In late 1995-early 1996, three civil engineering applications using tires as lightweight fill started heating up underground, generating steam, fire, and oily runoff (in one instance). All three spontaneous combustions (exothermic reactions) occurred in road projects--two in Washington and one in Colorado. Recent studies have identified several common conditions in the three projects and precautionary guidelines have been recommended by University of Maine Civil Engineering expert, Dana Humphrey. Moreover national guidelines from the American Society of Testing Materials (ASTM) are under review and expected to be promulgated relatively soon. To place the fires in perspective, there have been over 70 successful applications of tires in civil engineering projects.

A series of reports prepared for the Executive Office of Transportation and Construction (EOTC) on the use of recyclable materials in construction projects made two long-term recommendations for uses for tire chips. These reports were funded by EOEA and managed by DEP. The first recommendation is to use tire chips as lightweight embankment fill, and the second recommendation is to use them as retaining wall backfill. In both cases the suggestion is that MHD review past and pending research results and conduct field trials on these uses. For short term implementation the report recommends use of crumb rubber modified asphalt cement and railroad crossing mats.

In Massachusetts, Routhier Tire Company and the Middleboro Tire Recycling Company have received BUDs to allow tires to be used as daily cover at various landfills, in drainage applications, and have other BUD applications pending. Routhier has also employed tire shreds as fill for a new highway interchange in Portland, Maine. EOEA/DEP are working with the Massachusetts Highway Department to develop demonstration projects that will further develop the market for engineering uses of chipped tires.

Crumb Rubber Products

Tires can also be further processed to yield a crumb rubber product which is relatively free from wire or mesh. Crumb rubber varies considerably in size--ranging from a powder-like consistency to that of small beads. Tire crumb can be added to soil to improve drainage and resiliency on grass-covered athletic fields or tracks, to asphalt to improve performance, added or combined with a polymer mix to strengthen the backings on rugs, shoe soles and other materials. Alternatively, it can be used to manufacture rubber products like railroad crossing mats, gymnastic fields, solid rubber wheels, and fatigue mats.

By most accounts, it appears that the crumb rubber market is improving. There appears to be an increasing demand for high quality crumb because it can be used in diverse end markets, including finer mesh sizes for broader, higher specification end products. Although 30-40 inch mesh applications such as mats and rubberized asphalt remain the foundation of the crumb industry, expanded use of high quality crumb attracts the polymer industry, the electric utility industry, as well as Michelin and Ford.

In Massachusetts, Mainline Tire Recycling company of New Bedford formed a new division to operate with Mainline and F&B Enterprises to produce crumb rubber chips for playground applications. The division sells to schools and recreation departments and also markets some chips for horse footing.

EOEA/DEP Steps To Develop Tire Market Opportunities

- Provided \$180,000 over the last three years to the Massachusetts Highway Department (MHD) through the Clean Environment Fund to help increase MHD's use of recycled products in transportation applications. This recycling project has resulted in identifying four uses of shredded tires that have the potential to be economically viable.
- Working towards the establishment of a statewide contract for the purchase of retreaded tires by state and municipal agencies.
- Loaned \$150,000 (through EOEA/DEP's Recycling Loan Fund) for the start-up of a plant that will manufacture new raw materials from old tires. DEP is working with several additional companies capable of employing new technologies to make products out of used tires.
- Gave Beneficial Use Determinations (BUDs) for the use of crumb rubber in landfill and drainage applications and are evaluating other proposals.
- Encouraging the use of crumb rubber in a forthcoming landfill closure operation.
- Work with the Strategic Envirotechnology Partnership (STEP) and new tire processing technologies.

Tire Legislation

For at least 7 years, a variety of tire management bills have been filed in the legislature. In 1997, the Joint Committee on Natural Resources and Agriculture placed all the tire bills in a study and proceeded to draft a single, comprehensive bill. The bill was reported out of the Committee favorably and is now with the House Ways and Means Committee. DEP and EOEA are now reviewing the draft legislation.

Provisions Of The Bill

- Imposes a time-limited (10 years) per/tire fee on tire retailers (\$1.50/new tire under 20 in.-- \$3.00/tire above 20)
- Establishes a dedicated Scrap Tire Management Fund into which the fees, fines, permit fees, and repaid loan monies are deposited.
- Allocates 60% of the funds for cleanup of abandoned scrap tire piles and the remainder for market development incentives, the development and distribution of educational materials, and the establishment of a comprehensive scrap tire management system.
- Mandates retailers to take back used tires from consumers.
- Requires DEP to regulate generators, transporters, and management facilities and to develop new, more specific tire rules.
- Institutes a system to track the movement of tires and to ensure that appropriate parties are held liable

Planning for Contaminated Media Wastes

The current capacity planning assumptions for non-MSW are based upon the types and quantities of material currently disposed and processed at solid waste management facilities. Currently C&D waste comprises nearly 94% of this category. For the past year a special project team has been working toward developing new protocols and criteria for managing a broad range of potentially large volume of materials. Because these materials are not generally classified as solid wastes and have typically not been managed through the solid waste management system, past solid waste Master Plans have not specifically accounted for them. These "contaminated media" include: materials from harbor dredging; contaminated soil; excavate from large roadway projects; and 21E remedial actions. The following list is a breakdown of the estimated volumes of material within each of these categories and, management approaches in place or being reviewed by DEP and other agencies.

Several of the components in the contaminated media stream, such as wastewater residuals, are currently landfilled and their volume is built into current non-MSW capacity projections. For these components the methodology for capacity planning also anticipates, to some extent, the potential for increases in generation by projecting future need based on the average tons disposed in prior years. Thus, a trend toward increasing non-MSW generation will be reflected in increased need projections in future Updates. However, in the case of other contaminated media (such as that discussed below) the disposal is not accounted for in capacity projections. As part of its agenda the DEP contaminated media team will continue to monitor and update waste generation estimates and potential management scenarios. Based on those reports, the Department will propose a mix of market and plan-based strategies to promote maximum reuse and recycling and provide for necessary disposal alternatives.

Major Construction Project Wastes

The composition of constructing and demolition waste from major infrastructure projects within the Commonwealth varies greatly depending on the source. The vast majority of all construction and demolition waste is generated in major metropolitan areas and individual projects can create greater than 1,000 tons each day.

- Central Artery/Third Harbor Tunnel Excavate: (1997 to 2002) 4 million cubic yard (MCY) of contaminated historic fill; 3 MCY clay/till
- Combined Sewer Overflow projects. This material will be managed within the existing C&D processing and disposal system.

General 21E Remediation Wastes

Contaminated sites are being cleaned-up throughout the Commonwealth. Some of the waste material generated from the sites must be removed, but is not considered hazardous. Currently the Department allows certain waste materials from those sites to be used in landfill operations and other environmentally safe activities.

For 1997 to 2005:

- Hot mix/cold mix (contaminated soil that is recycled by being incorporated into cold or hot mix asphalt) and soil processing facilities: 280,000 cubic yards
- Majority of material is currently used at solid waste landfills as cover or temporary haul roads.
- Material taken directly to landfills for use as daily cover or grading/shaping material: 110,000 c.y. Over the next few years, DEP may be able to redirect a significant percentage of these soils into roadbed material, but due to the large number of other waste materials that are also

competing for this market niche (glass, shredded tires, etc.), it is unclear how much of the 21E materials will actually end up in roadways.

Wastewater Residuals

Wastewater residuals (sludges, etc...) are generated from wastewater treatment plants. The large quantities of sludge currently being disposed of at landfills are the result of successful water pollution control efforts. Disposal of these materials is primarily through co-disposal efforts with other solid wastes.

- Grit/screenings: 20,000 c.y./year. Currently disposed in landfills and accounted for in waste projections
- Biosolids codisposed in solid waste landfills: 26,000 Dry tons per year (DTY) @ 20% solids = 130,000 tons of material.
- Capacity projections assume co-disposal ends by 2000 due to beneficial reuse.

Dredged Sediment Wastes

- Marine Sediments are created during dredging operations. Between 1997 and 2005: 8,000,000 c.y. of sediment material will be produced, assuming all 8 Designated Port Areas are dredged during this time period. The estimated amounts to be removed each year are as follows:

1997 10% = 0.8 MCY
1998 40% = 3.2
1999 10% = 0.8
2000 10% = 0.8
2001 10% = 0.8
2002 10% = 0.8
2003 5% = 0.4
2004 5% = 0.4
2005 0% = 0.0

DEP's preferred option is to dispose of the overwhelming majority at In-Water Confined Aquatic Disposal Facilities but this is subject to site-specific review and concurrence by federal agencies. Alternative options are upland reuse or disposal at landfills, and due to concerns with nuisance conditions most would be disposed. In addition, federal law requires consideration of upland landfills when doing the cost/benefit analysis for the disposal of these materials. Therefore, there is a potentially large volume of contaminated sediments that might require disposal in a lined landfill.

Disaster Debris

The disposal problems created by a natural disaster are many for all concerned. For the field of waste management, a significant amount of waste material is rapidly generated which must be quickly cleaned up, transported and processed or disposed. DEP has encouraged those responsible to utilize a hierarchy of management practices to process the material generated. The Department has, in limited circumstances, allowed the open burning of trees, limbs and brush under the supervision of the local Fire Chief.

In this class of material, potential volumes are not time-dependent, but rather depend on the severity of a natural disaster, therefore potential 1997 and 2005 figures are identical. The quantity of

material generated by a natural disaster has been estimated for three scenarios and reflect the amount of material that would require management.

1. Category 1 Hurricane: 50,000 c.y.
2. Category 3 Hurricane: 3,500,000 c.y.
3. Seismic, Boston 6.0 on Richter Scale: 10,000,000 c.y.
4. Ash Disposal

In 1987 DEP established three disposal policies that remain in effect: 1) ash must be disposed in ash-only landfills called monofills, or in separate ash-only sections of MSW landfills such that ash will not be co-disposed with other wastes; 2) combustion facilities must not be constructed unless the facility has developed sufficient ash disposal capacity to handle 20 years of ash at the time of construction; and 3) combustion facilities must be responsible for developing new ash disposal capacity prior to the depletion of available capacity.

These policies were established to ensure that there will be sufficient ash disposal capacity available to handle a facility's ash and acidic leachate generated by solid waste does not come into contact with ash and increase the chance to leach heavy metals from ash.

Ash is currently disposed of in monofill facilities separate from MSW and non-MSW for several reasons. DEP views ash disposal capacity as an integral part of solid waste combustion facility operation. Ash is also easier to manage and dispose in a monofill than co-disposed in an MSW landfill. In addition, if in the future ash can be demonstrated to be safely used it may be possible to mine a monofill and recover the previously disposed ash for beneficial use.

The majority of combustion facilities recover ferrous metals from ash for recycling and in some cases from the solid waste prior to it being burned. In addition, one facility also recovers non-ferrous metal for recycling. The total ferrous and non-ferrous metal recovered from ash in 1994 was 88,000 tons and represents a significant savings in landfill capacity.

Other Materials

Other materials which have been disposed of in landfills as their primary management option include street sweepings, residuals from utilities (catch basins, sewer cleaning) and paper sludges. The Environmental Protection Agency (EPA) is also considering changing the definition of hazardous waste under federal law which may result in some waste materials moving from the hazardous into the solid waste management system. The waste management hierarchy directing reduction and reuse as the preferred management options will be applied to these materials to the extent non-disposal technologies are available and cost effective. For example, DEP has recently adopted a policy on reuse of street sweepings in roadways and in certain compost operations. One paper manufacturer has obtained a Beneficial Use Determination to use sludge from its water treatment facility as landfill cover. Paper sludge is also being used as a carbon source in commercial composting operations. Through Beneficial Use Determinations DEP is providing for reuse of a wide range of materials that had traditionally been landfilled.

Chapter 4: Projections and Allocation of Solid Waste Disposal Capacity

Introduction

Since 1998, EOE and DEP have maintained an overall solid waste disposal policy that limits total waste disposal capacity to the amount generated within the state so that there will be no net import of waste into Massachusetts or no net export of waste out of Massachusetts. While this policy does not regulate the amount of solid waste that is transported across the state's borders, from any particular region, it does not require that DEP keep tabs on the total amount of imports and exports to ensure that the two are balanced across the entire state. The no net import/not net export policy was designed to protect our environment and minimize the threats to our natural resources and quality of life due to the impacts of solid waste disposal, while at the same time recognizing that the state has a responsibility to manage the waste its citizens produce - but no more than that - in an environmentally sound manner.

Chapter 4 updates projections of solid waste disposal capacity over the next ten years. Current projections indicate that there is need for additional capacity starting 1998 to dispose of non-MSW waste such as construction and demolition debris, but that there continues to be no need for additional MSW capacity through 2001. The projections have been modified since the draft, primarily for reasons discussed below.

- waste generation is greater than previously calculated due primarily to increases in commercial MSW and non-MSW, and partly due to better data reporting;
- the operating life of several landfills has been modified; and
- the permitted, but unconstructed Shirley waste to energy facility has been removed from future projections.

This chapter also addresses how DEP will allocate disposal capacity over the long-term, including reopening the development of the Capacity Allocation Process (CAP) regulations in light of comments received during the public comment process.

The projections presented in this chapter have been refined in response to numerous comments received on the draft 1997 Solid Waste Master Plan Update (Update). Comments ranged from support for continuing the moratorium on further permitting of municipal solid waste (MSW) capacity to comments that the Department had based capacity analysis on faulty data and that there was need not only for non-MSW but also for MSW capacity in 1998.

In response to comments from landfill and combustion facility operators, waste haulers and some regional waste management districts regarding data used in the draft, the Department established a data work group (the Data Group) to examine data issues. The Data Group includes representatives from waste management companies, haulers, environmental groups, and consulting firms and was charged with examining the sources and use of the data used in the Update. The Data Group decided to first address short-term issues that could be addressed in this final 1997 Update, and second, address longer-term issues that will affect future Updates. The Data Group met six times over two months and decided to address five major issues: 1. peak seasonal waste generation; 2. models for providing adequate regional management capacity of non-MSW in 1998 and 1999; 3. how to allocate the reserve capacity first discussed in the draft; 4. waste imports and exports; and 5. MSW recycling.

The major issue affecting the capacity projections relative to the draft plan was whether the Department fully accounted for waste exports and imports. Whereas in the draft update DEP had used reports from transfer stations for the estimates of exports, with the assistance of the Data Group members, DEP contacted other state environmental agencies, out-of-state disposal locations, and updated information from the annual facility reports.

Those facilities whose data was unavailable when the draft Update was developed assisted us to determine that waste exports in 1996 were, in actuality, 824,000 tons rather than 408,000 tons as previously reported. Due to better reporting, waste imports also rose a small amount from 608,000 tons to 652,000 tons. In large part these changes reflect the fact that out-of-state waste facilities had not yet completed their annual reports to their respective state environmental agencies at the time the projections for the draft plan were developed. In addition, the draft plan had relied on information supplied by transfer stations, but a significant amount of waste does not go through transfer stations, but rather is directly hauled to a disposal facility and therefore had not been captured in the previous estimates.

As a result of increases in exported waste, the total generation of MSW and non-MSW increased, while the amount reported to have been managed by Massachusetts facilities did not change significantly. In addition, some recyclables that went to out-of-state recycling facilities that had not previously been counted is counted as a result of these improvements. In particular, recyclables from municipal facilities that formerly went to an in-state MRF are now going to an out-of-state facility. Also, cardboard from some large grocery chains is also going to out-of-state facilities and had not previously been captured by DEP's methodology. Adding these recyclables into the analysis resulted in the 1996 recycling percentage remaining at 33%, even with the higher generation rate.

Projections of Future Disposal Need

Since the 1990 Master Plan was published, DEP has limited the development of disposal capacity based upon need projections. The methodology for determining need for additional capacity has been continuously refined to reflect the improved quality of the data and to promote the principles of integrated solid waste management. For example, the 1995 Update utilized capacity needs analysis to limit non-MSW landfill expansions in addition to the prior constraints placed on MSW disposal projects.

In the prior two Updates, capacity need was projected through 2000. This Update restores a ten year planning horizon first adopted in the 1990 Master Plan. In addition, these new projections reflect a change in the method of calculating the MSW generation rate. In previous Master Plans, projections of disposal capacity need were based upon a fixed MSW generation rate of 6.75 million tons (mt) per year, whereas in this final 1997 Update a generation rate of 7.04 mt is used, reflecting the fact that generation has exceeded the 6.75 mt planning rate for the past two years. In addition projections are now based upon a rolling average of the last two years of data. The current average of 7.04 mt is then used as the waste generation rate in making the future disposal capacity projections in this plan through the year 2000, after which waste generation increases only as a result of projected increases in population while holding the per capita generation rate level.

While the waste generation rate used for projections has been increased, EOEa and DEP remain firmly committed to source reduction strategies including: unit-based pricing; packaging reduction; home and institutional composting; media campaigns; technical assistance and partnering with business associations such as WasteCap. The Commonwealth's

success in these efforts will be necessary to keep the “per capita” generation rate from increasing, which would result in an even greater growth in waste generation.

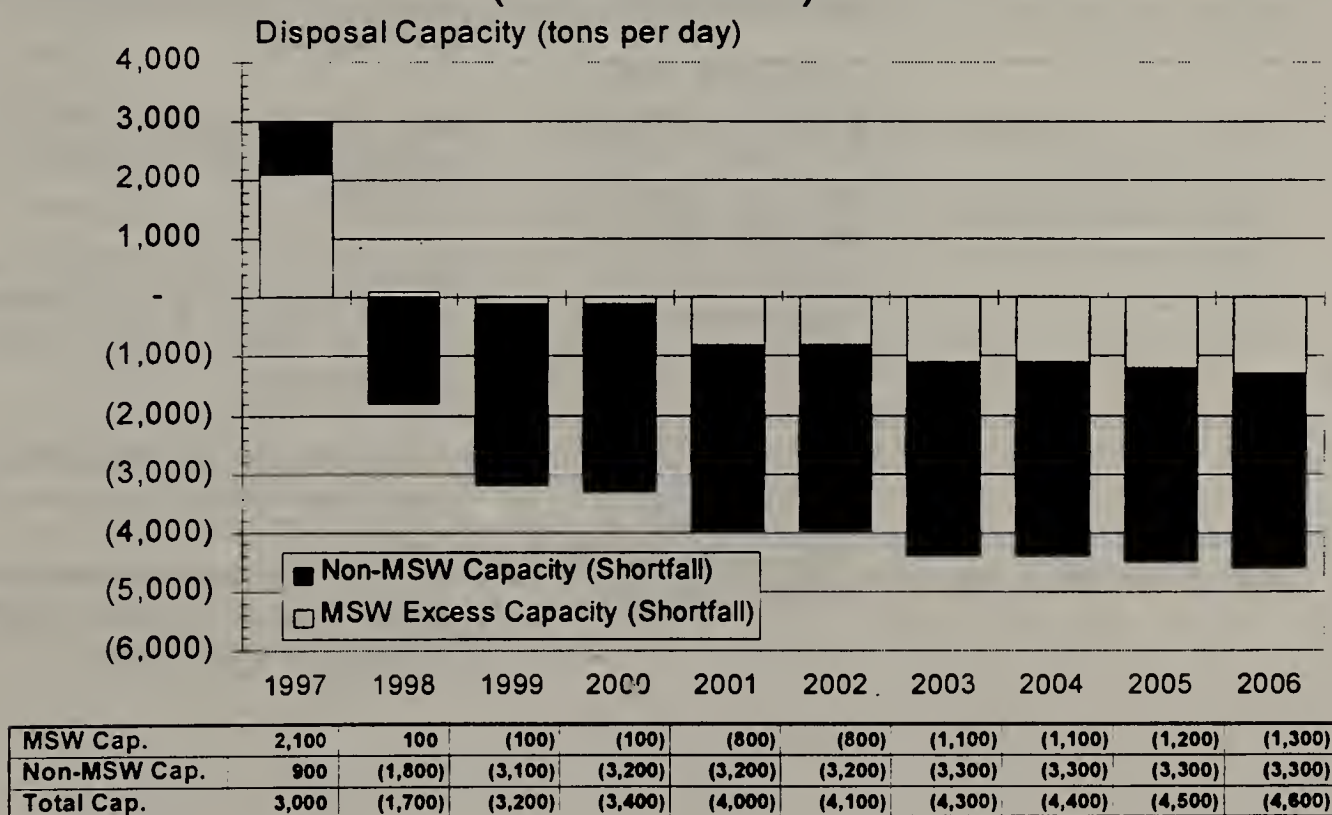
Figure 4-1 depicts the excess or shortfall of solid waste management capacity for the years 1997 through 2006, MSW, non-MSW, and for the total system (MSW and non-MSW combined).

The 1995 Update projected that non-MSW capacity would be exhausted in 1996, whereas the projections presented here indicate that there is sufficient capacity through 1997, which is due to revisions in the operating terms of several commercial landfills that were permitted prior to the release of the 1995 Update, and to the disposal of C&D waste in 14 unlined municipal landfills to bring them up to closure grades and reduce the community’s closure cost burden in accordance with DEP’s policy to promote accelerated closure of unlined landfills BWP 95-022).

The projections in **Figure 4-1** indicate that while there was more than sufficient disposal capacity to handle all of the state’s solid waste in 1997, commencing in 1998, a capacity need of 1,800 tpd of non-MSW is projected. Consistent with the 1995 Master Plan, there is no need for MSW capacity until 2001. While Figure 4-1 shows a de minimis shortfall of approximately 100 tpd for 1999 and 2000, this represents only one half of one percent of total MSW generation. In the 1998 Update, DEP will again reevaluate its capacity analysis to bring the data up to date and more accurately predict disposal capacity need in 1999 and 2000.

The non-MSW capacity need results from the combined effect of the closure of numerous unlined landfills and depletion in capacity at several of the large commercial landfills. The non-MSW short fall shows an increase to 3,100 tpd in 1999 and a slight increase again to 3,200 tpd in 2000. After the year 2000, total disposal capacity need is projected to grow at a rate of several hundred tons per year over the next six years culminating in a 4,600 tpd total shortfall in 2006.

Figure 4-1 Waste Generation and Management (1996-2006)



In summary, the draft 1997 Update, had projected that there was no need for additional MSW capacity until the year 2001, while there was need for non-MSW commencing in 1998. The changes in the projections from the draft to the final 1997 Update are first due to an increase in the waste generation rate resulting from more complete data than was available for the draft, and second due to modifications to the operating life of several landfills resulting from consent orders signed since the draft plan was published. Waste generation was greater than previously calculated because more solid waste was exported from the state than had previously been accounted for. During the public comment period on the draft Update several commenters suggested that Massachusetts had exported much more waste than indicated in the plan. As a result of these comments, and with the assistance of the Data Group several out-of-state waste facilities were resurveyed. Several of these facilities as well as transfer stations had not yet submitted annual reports to their respective state agencies at the time the draft Update was being prepared. In addition several transfer stations had submitted their annual reports too late to be included in the draft Update.

Projection Methodology

The basic steps in developing the estimates of future capacity need are presented in **Table 4-1** and in Appendix A.

In expanding the planning horizon beyond 2000, certain assumptions were adjusted to take into account long term population growth.

- For capacity planning purposes, the MSW generation rate is calculated based on the rolling average of the two preceding years and projected forward for the ten year planning period.
- After 2000, MSW generation is projected to increase slightly due to predicted population growth in Massachusetts, while per-capita generation will be assumed to remain at its current level. Based on population estimates, this will result in a 0.5% annual increase in waste generation.

TABLE 4-1: STEPS IN DEVELOPING ESTIMATES OF FUTURE CAPACITY NEED

- estimate in-state solid waste generation;
- estimate imports and exports of solid waste;
- reduce the amount of solid waste requiring disposal by applying the Commonwealth's source reduction and waste diversion goals;
- reduce the amount of non-MSW requiring disposal by applying the rolling average rate of non-MSW processing and recycling;
- determine the amount of combustion capacity and landfill capacity remaining in the Commonwealth for each year by reviewing Annual Facility Reports and permits of each operating facility;
- allocate the post-diversion MSW requiring disposal first to combustion facilities, then to active landfills;
- capacity need represents the amount of additional landfill capacity needed to dispose of solid waste not diverted or processed by other methods.

- The combined recycling and composting rate for MSW is projected to be 37% in 1997, 40% in 1998, 43% in 1999 and 46% in 2000. This maximum diversion rate will be maintained through 2005 unless combustion capacity or landfills are phased out and recycling is substituted.
- To account for variability, the C&D generation rate is projected based on a three year rolling average of C&D material landfilled and processed as reported by facilities in DEP surveys and projected forward
- For other non-MSW materials, the generation rate is based on three years of data on disposal and recycling of these materials, and reflects the average for each of these components. The generation rate will decrease slightly each year based on a projection of decreased co-disposal of biosolids between 1996 and 1999 as more biosolids are diverted from landfills to beneficial uses as municipal landfills close, after which co-disposal of biosolids in MSW landfills will be phased out completely.

Reserve Capacity

Previous Updates have discussed whether a “safety net” or “buffer” should be built into capacity need projections that would acknowledge contingencies such as margins of error in data reporting or analysis; variability in waste generation rates; unexpected shutdowns of combustion facility operations; or unanticipated changes in the timetable for landfill closures. This plan incorporates a formal mechanism to allow the Department to meet a variety of possible contingencies by temporally permitting landfills to handle more waste. In addition, new landfill permits will include language specifically indicating that the facility may accept waste on an emergency basis upon application to, and approval of, DEP in accordance with this mechanism.

A mechanism to temporarily allow landfills to increase the amount of waste they handle is needed to ensure that DEP can quickly and effectively respond to waste disposal emergencies. The reduction in landfill capacity as a result of closures of unlined landfills reduces the ability of the disposal system to respond to emergency disposal situations. The Data Group recommended that DEP formalize a mechanism to enable the Department to provide additional capacity that meet emergencies that may arise without the need to modify facility permits.

DEP will adopt the Data Group’s recommendation with some modification. DEP has determined that contingencies fall into two basic categories: short-term emergencies such as when one or more combustion facility boilers experience short-term, unscheduled down-time; and longer-term conditions such as when waste generation rates increase significantly above projected values. **Table 4-2** presents the types of actions that can be used to meet either short-term or long-term capacity emergencies and whether the Regional Director or the Commissioner will be responsible for allocating capacity to meet the emergency. While there is no tonnage limit set for reserve capacity, the total permit limit on the amount of waste a facility can take will not change under this provision. Under this provision, DEP will allow permitted non-MSW capacity to be used for MSW, or allow facilities to temporarily increase the MSW or non-MSW they accept, within annual limits. Any facility that is allowed to take in more waste earlier in the year will have to either take less waste later in the year or close early.

**TABLE 4-2: ALLOCATION OF RESERVE CAPACITY FOR
EMERGENCY SITUATIONS**

	Possible Outcomes	Regional Director	Commissioner
Short-Term Capacity Emergencies	Increase LF capacity above permit cap for limited time but, within its annual permit cap	X	
	Convert non-MSW capacity to MSW capacity within the permit cap	X	
	Convert non-MSW capacity to MSW capacity above the permit cap for limited time but, within its annual permit cap	X	
Long-Term Capacity Shortfall	Increase LF capacity above permit cap but, within its annual permit cap		X
	Convert non-MSW capacity to MSW capacity within the permit cap		X
	Convert non-MSW capacity to MSW capacity above the permit cap, within its annual permit cap		X

Capacity emergencies will be addressed by the office of the DEP Regional Director or Commissioner on a case-by-case basis in response to a demonstrated capacity emergency. The process will require substantiation by the affected facility.

Upon satisfaction by the DEP Regional Office of the existence of a demonstrated short-term disposal capacity shortfall [less than 30 days], the Regional Director will have authority to approve use of designated regional landfill(s), for the duration of the shortfall, but shall not exceed a period of one month. For any period longer than one month, the DEP Commissioner must authorize permitting of the reserve capacity to respond to this long-term shortfall. In cases where the use of reserve capacity would cause the designated landfill(s) to exceed its permits, such disposal will nonetheless be permitted in order to respond to an imminent threat to public health, safety, or environment.

The Data Group further recommended that use of a facility for reserve capacity in the case of an emergency should be viewed favorably during future permit reviews because the facility agreed to shorten its permitted operating life to handle the waste. The Department will consider including this criteria in the CAP regulations revisions.

Regional and Seasonal Capacity

The decline in available disposal capacity and number of landfills between 1997 and 1999 raises concerns among some in the disposal industry and municipal officials not only about

statewide disposal capacity, but also whether certain areas of the Commonwealth will be without convenient or affordable disposal facilities.

The Department received a significant number of comments from the waste management industry and waste haulers encouraging the Department to consider regional need in its permitting decisions so that no region of the state would be unduly burdened with a disproportionate lack of capacity. Under the draft CAP regulations, a proposed project's relationship to regional capacity need was a criterion on which competing disposal capacity applications would be evaluated. Regional waste capacity distribution, therefore, was built into the project selection determination. Under the current regulations, applications are not comparatively reviewed. Figure 4-4 (attached as the last page of this document) provides a pictorial perspective on the distribution of MSW and non-MSW disposal capacity within the Commonwealth in 1998, depicting disposal facilities and their capacity, type of material accepted, and the origin of waste disposed at the facility. Shaded towns indicate that the facility in the town accepts waste from only the town and not from surrounding towns. The map indicates that few landfills will remain once the unlined sites are closed and indicates which areas in the state must be carefully addressed to insure that regional disposal capacity is available. This map only contains those facilities with current permits to operate in 1998 and does not include other landfills that may receive a permit to meet non-MSW need projected for 1998 and 1999.

To ensure that the distribution of capacity accounts for variations in regional need, DEP will compare the current distribution of waste disposal facilities to the need for capacity in each of the DEP regions. Based on a simple population model, this methodology will be used to determine how much disposal capacity is required to adequately serve that region. In issuing permits, the Department will take into consideration how well proposed capacity matches up with regional need. In addressing regional need, the Department may look at both the Northeast region and the Southeast region together since waste has traditionally moved from Boston both north and south. In addition, DEP funded a study of the disposal capacity needs for non-MSW generated on Cape Cod and for bulky materials that cannot be combusted by the SEMASS facility. Therefore, Cape Cod may be considered as a separate sub-region.

During the public comment period the Department received comments on the need to consider seasonal variations in waste generation that results from spring and fall cleanup periods and, for Cape Cod, the summer tourist season. The Data Group presented information to the Department indicating, for example, that Cape Cod generates 17-18% more waste in July and August than the average for the entire year.

Since the capacity need projections are annual projections and waste generation is averaged for the entire year the projections of capacity *do* take into account the total amount of waste which needs to be managed for the entire year. However, given seasonal waste generation patterns, there may be periods when the facility would need to exceed its daily permitted tonnage limit over a short period. To address this problem, the Department will adopt a more flexible approach to permitting facilities with regard to tonnage limits that will allow facilities to meet waste generation demand, while remaining within their currently permitted annual tonnage limits. Currently, permits included daily tonnage limits based on their annual tonnage limit and allowances are made so facilities can exceed their daily limits a certain number of times per month or year (as long as their annual limits are not exceeded). The Department will expand on the current practice and provide more flexibility to exceed daily limits for more extended periods, while maintaining current annual tonnage limits. Facilities will have more discretion on how much waste to handle on any given day so they can respond to seasonal waste generation patterns, provided they still do not exceed their annual tonnage limits. For example, this will require that Cape Cod facilities to take less than the average during the winter months when less waste is generated.

In the 1995 Update, DEP and EOEa instituted a moratorium on DEP approval of most site assignment and permit applications for disposal projects. The moratorium was adopted in response to the discrepancies between a small projected capacity need (204,000 tons per year of only non-MSW commencing in 1998) and a large proposed capacity (2 million tons of MSW and non-MSW landfill capacity proposed in pending site assignment or permit applications). As mentioned earlier in this chapter, DEP's capacity projections have indicated a need for new non-MSW disposal capacity starting in 1998. Therefore, the moratorium on new landfill capacity will be temporarily lifted to permit non-MSW disposal capacity for 1998. Since there is no need for MSW capacity till 2001, the moratorium on MSW capacity will remain in place. As soon as the non-MSW capacity is permitted, the moratorium will be put back in place, at least until the Capacity Allocation Regulations (CAP) are modified.

Since the announcement of the moratorium in 1995, DEP has received extensive comments, both in the context of specific project reviews and during the comment period for the draft CAP regulations. While many of these comments will be addressed when the CAP regulations are opened to public discussion, there are certain changes and clarifications regarding the moratorium that DEP concludes should be implemented immediately. The applicability of the moratorium, including the proposed changes, is summarized below, followed by a brief description of the changes.

The moratorium **applies** to approval of the following applications:

- The issuance of site suitability reports for landfills until the final CAP regulations are promulgated. Following promulgation, CAP regulations will allocate both MSW and non-MSW capacity if determined to be necessary;
- Permits to construct new or expanded disposal capacity, except as discussed in the section below entitled "Interim Capacity Allocation Procedure";
- Permit modifications to create disposal capacity through reclamation or mining of an existing landfill, except for the proposals DEP has determined may proceed through further environmental review under the Interim Policy on Designating Innovative and Alternative Technology Candidates for Landfill Remediation Projects (May, 1996);
- Permit modifications to increase MSW tonnage limits.

The moratorium **does not apply** to the following actions:

- The issuance of permits for disposal facilities which are dedicated to disposal of residue from waste recycling or processing operations;
- Approvals to increase the disposal rate of non-MSW pursuant to a consent order for closure and capping of an unlined municipal landfill;
- Disposal of waste pursuant to compliance or enforcement orders;
- Disposal of waste pursuant to an approval for a demonstration project or innovative technology;
- Actions necessary to respond to an imminent threat to the public health, safety or environment ; or

- Permits for landfills that accept only combustion facility ash or those waste components DEP classifies as contaminated media.

In addition to the exemptions listed above, DEP may permit, on a site specific basis, MSW disposal capacity at non-MSW landfills where:

- The MSW is generated **within the municipality in which the non-MSW disposal facility is located (host community)**, the amount of MSW does not exceed 50 tpd, and the municipality certifies that it meets or exceeds the average statewide recycling rate; or
- DEP determines that the site is appropriate to provide reserve MSW disposal capacity.

The moratorium revisions presented above include several significant changes. The first is that the moratorium will no longer apply to DEP review of site assignment applications once the final CAP regulations are promulgated. At that time facilities may choose to proceed through site assignment to allow them to be in a position to submit permit applications when the moratorium is lifted in the future to meet a projected need.

The exemptions recognize that landfills dedicated solely to disposal of combustion ash or certain types of contaminated media, where insignificant amounts are currently being recycled or reused other than in landfill related uses, should not, at present, be subject to the moratorium.

Based on comments received during public review of the draft CAP regulations, the general exemption for landfills disposing 50 tpd or less has also been eliminated. Effective on the date of publication of this Update, all landfill projects will be subject to the moratorium regardless of size.

The moratorium revisions recognize that on many occasions non-MSW landfills accept MSW from their host community as part of the agreement between the operator and the municipality. DEP will allow that practice to continue to the extent that the amount of host community MSW does not exceed 50 tpd and the community's recycling program achieves at least the statewide average municipal recycling rate for the most recent years on which DEP has data.

Another revision provides an exemption to landfills that are a dedicated and integral part of a recycling or waste processing operation, handling only residuals from those operations. This exemption is designed to promote investment in, and construction of, waste diversion facilities by removing the potential barrier of insecurity concerning the long term availability of residue disposal.

Interim Capacity Allocation Procedure

The 1995 Update anticipated that the final CAP regulations would be promulgated before the moratorium on review of applications was to be lifted. The scope and extent of public comment already received on the draft CAP regulations, as well as outstanding requests from both industry and environmental advocacy groups for further dialogue, has led DEP to conclude that more discussion is needed on these regulations. DEP has decided to temporarily lift the moratorium on non-MSW permits prior to promulgating the revised CAP regulations to address the projected capacity need seen in **Figure 4-1**. With the release of this final 1997 Master Plan Update, permits will be issued to meet the non-MSW disposal need established in the projections.

The process to address capacity requirements and the CAP regulatory revisions will proceed as laid out in **Table 4-3**. These steps will fulfill DEP's commitment to permit adequate disposal capacity and also allow sufficient time for further public discussion of alternatives to the current permitting practices and standards.

Implementation Rules for Interim Permitting

During the transition period to finalize and implement a revised capacity allocation process, the following rules will be applied to the review of pending permit and site assignment applications:

- Permit reviews will be limited to landfill projects which can add non-MSW capacity to the system in 1998 and are in compliance with existing permits or approvals. Applications to construct additional disposal capacity that are not proposed to commence operation until 1999 or later will remain subject to the moratorium. This is intended to

TABLE 4-3: TIMELINE FOR INTERIM ALLOCATION PROCEDURE FOR NEW DISPOSAL CAPACITY

July, 1997	<ul style="list-style-type: none"> • Draft 1997 Master Plan Update Issued • Temporarily lift the moratorium for capacity allocations for additional non-MSW. • Commence review of pending or new applications for site assignment or permits for capacity. Evaluate applications in accordance with the current criteria and procedures contained in 310 CMR 16.00 and 310 CMR 19.000.
December, 1997	<ul style="list-style-type: none"> • Issue the Final Update • Allocate additional non-MSW capacity through 1999 in accordance with the current site assignment and permit regulations and the provisions in the Update. • Re-impose the moratorium on additional facilities once sufficient non-MSW capacity is permitted. • Re-open public dialogue on the draft CAP regulations for the purpose of promulgating revised regulations consistent with objectives of limiting capacity development based on need, upgrading the public health and environmental standards for permitting disposal facilities, and accelerating the development of an integrated solid waste management system.
July, 1998	<ul style="list-style-type: none"> • Promulgate revised CAP regulations and lift moratorium on review of site assignment applications by DEP. • Permit future capacity need, if determined to be necessary, in accordance with revised CAP regulations.

ensure that permits approved during the transition period will be used to meet the projected non-MSW capacity shortfall for 1998 and 1999, while future expansions will be subject to the permit requirements in the revised regulations. This will allow the revised CAP regulations to apply to the largest number of future projects.

- DEP will conduct application reviews to determine whether a project meets all current regulatory requirements.
- In order to ensure the total average daily tons allowed, are consistent with average annual need projections, the amount of capacity allocated among permitted facilities will provide each facility all, or a portion of, the tons requested in their applications. The initial 1998 allocation will be increased at some facilities to accommodate seasonal waste flows and projected increases in capacity need for 1998 and 1999.
- The operating term of all permits issued during this period shall expire on December 31, 1999, provided the applicant may submit information demonstrating that an alternative term is essential to the project's development. DEP may extend the term if it determines that the extension is essential and the project will make a direct and substantial contribution to meeting a unique regional need or diverting waste from disposal. Once the revised CAP regulations are promulgated, DEP will review site suitability applications with the condition that an affirmative decision on suitability does not provide any assurance of a future permit.

CAP Regulations: Response to Comments

The draft Capacity Allocation Process (CAP) regulations were released for public comment in December 1996. The key change proposed for the site assignment and permitting regulations was to shift from an independent review of individual disposal projects to a comparative review of all new or pending projects. This concept proposed that DEP would review all permit applications concurrently to select the site(s) which best met the needs of the state with regard to protection of public health, safety and the environment and with regard to location. Equally important, the draft regulations expanded the scope of the existing site assignment and permit criteria, adding new standards by which projects would be ranked.

The draft CAP regulations provided for environmentally sound disposal projects that would best meet the needs of the Commonwealth's integrated solid waste management system, and reduce the transaction costs of environmental review for project developers, affected municipalities, concerned residents, and the environmental agencies.

The Department received extensive public comment on the draft CAP regulations. Supporters of the revisions commented that the regulations advanced the core goals and objectives of the Master Plan's waste management hierarchy and provided momentum for reaching the 46% waste diversion goal. Many comments also expressed the view that the current site assignment and permit criteria were insufficient to rigorously screen out projects that had the potential to degrade important natural resources and threaten public health or safety.

These issues have been addressed by the decision to temporarily lift the moratorium for non-MSW capacity and to revisit the draft CAP regulations. DEP will convene an advisory panel and create a forum for the regulated community, citizens, environmental advocacy groups, and other interested parties to reconsider the approach for capacity allocation within the framework of balancing disposal capacity development with capacity need. One suggested alternative is to convert some or all of the standards proposed as comparative factors in the draft CAP regulations into strengthened or expanded criteria within the current site assignment and permitting regulations. Promulgation of final revised regulations by July, 1998 will allow for project development and permitting of any future capacity deemed necessary.

Landfill owners, waste haulers, and other solid waste industry representatives who opposed the changes reiterated their long standing objections to the limits imposed on landfill development as a consequence of the capacity needs analysis. They asserted that DEP lacks authority to impose need-based limits; the market, not state regulatory policy, should determine how much landfill space is developed; the moratorium and capacity needs analysis are designed to force disposal prices higher so recycling will appear to be a preferable waste management alternative; and the net effect of the policy will be to create market conditions where smaller haulers will not be able to compete with integrated waste management companies.

The 1995 Update set out the legal authority and fundamental principles underpinning the need-based constraint on unlimited landfill development, a restriction that has been in effect since the 1988 site assignment regulations¹ (See 1995 Update, Chapter Four, pp. 36-38).

The policy constraining landfill development was not designed and has not been implemented over the past nine years to influence the relative costs of disposal and recycling. DEP is committed to ensuring that sufficient disposal capacity is available to meet the Commonwealth's need. DEP has neither the intention nor the ability to manipulate capacity limits to leverage exorbitant disposal prices to put recycling in a favorable light. Disposal prices are influenced by a multitude of diverse factors, including mergers and consolidations of waste management companies and disposal capacity demand and supply fluctuations throughout the Northeast and mid Atlantic states. As recent events also demonstrate recycling market prices are subject to cycles unanticipated by the most sophisticated industry analysts. For DEP to attempt to predict price trends in both these fluid markets and then make long-term capacity allocation decisions to achieve a price-based outcome would be a futile exercise.

Building an integrated solid waste management system is not predicated on artificially boosting disposal prices by engineering landfill shortages. As the programs described in this Update make clear, the state's consistent approach has been to create opportunities and provide incentives to expand the recycling infrastructure and promote sustainable development on both the supply and demand sides of the recycling loop.

The limitation on disposal facility development is primarily an expression of EOE's and DEP's mission to protect the public health and preserve our natural resources. The solid waste management hierarchy, a cornerstone of the Master Plan and accepted policy virtually nationwide, implicitly recognizes that landfills are a necessary but least desirable technology despite the technical and operating improvements that have mitigated their damaging potential.

On a regular basis DEP hears complaints about landfills due to odors, litter, truck traffic through neighborhoods, and concerns about fecal contamination to water supplies from seagulls feeding on garbage. Every acre of landfill generates hundreds of thousands of gallons of leachate annually that must be contained and treated. Each ton of MSW landfilled will produce 123 pounds of methane gas, a potent greenhouse gas.² While there are technologies available to manage these pollutants they still present costs and risks that should be avoided wherever possible. While recycling also generates pollutants, "lifecycle" studies demonstrate the advantages of recycling over the disposal alternatives.³

1 310 CMR 16.40 (effective 9/9/88)

2 Franklin Associates, *The Role of Recycling in Integrated Solid Waste Management to the Year 2000*, Chapter 6 and Appendix 1)

3 Dennison, R.A. *Environmental Lifecycle Comparisons of Recycling, Landfilling, and Incineration. A Review of Recent Studies, 1997* "Annual Review of Energy and the Environment, Volume 21, Annual Reviews Inc.: Palo Alto, CA.

The waste management hierarchy first established in the 1990 Master Plan, places source reduction first, recycling and reuse of waste second, combustion, with energy recovery, of MSW third, and landfilling of what cannot be managed through the first three means last. Landfills will have a detrimental effect on the growth of recycling in Massachusetts without regard to price comparisons. It would make it more difficult for the nearly 150 communities with long term waste to energy facility contracts to expand their recycling rates. If waste for combustion is not readily available to substitute for increasing amounts of recycled materials diverted from disposal, combustion facility operators may try to enforce guaranteed annual tonnage provisions that compel reimbursements from municipalities for lost tipping fees and energy revenues.

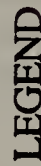
Permitting unnecessary landfills in the next two years also sends exactly the wrong message to the financial markets looking at making investments in recycling mills, to processors dependent on an adequate supply of recyclables, to newspaper publishers seeking to expand their purchase of recycled newsprint, to municipal officials evaluating waste management alternatives to replace their soon to be closed unlined landfills, and to recycling program administrators who are developing strategies to increase participation in residential and commercial recycling and composting programs.




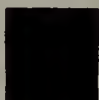







Critics of the CAP regulations also attacked the comparative aspects of the process for project selection proposed in the draft. Their major objections were that:

- The process was too lengthy to have capacity permitted and constructed in time for the projected 1998 shortfall;
- The regulatory development process to date did not allow sufficient opportunity for dialogue between DEP and the regulated community to achieve some common goals and avoid disruption of the system;
- It was inequitable to retroactively apply regulatory changes that discounted the investment made by project developers in their sites during the course of obtaining MEPA certification and site assignment;
- The ranking process would create the potential for subjectivity and other inappropriate factors to distort the selection results. Concerns about the potential adverse impacts of landfills should be addressed through a review and possible upgrade of the site assignment permit standards without relying on inter-project comparisons.

The revised regulations will provide the process for developing sufficient disposal capacity that presents the lowest impact on public health and the environment and is consistent with the framework of the waste management hierarchy. Focusing on that objective will not only provide a more effective method to achieve superior disposal capacity projects but, hopefully, will create a consensus between the public and the providers of waste management services on how our mutual goals can be most effectively met.

EAP RVP -
Success of Waste Prevention



	150 TPY landfill 100% MSW		100,000 TPY Combustion Facility 100% MSW
	10,000 TPY landfill 50% MSW, 50% nonMSW		450,000 TPY Combustion Facility 100% MSW
	50,000 TPY landfill 75% MSW, 25% nonMSW		1,000,000 TPY Combustion Facility 100% MSW
	200,000 TPY landfill 25% MSW, 75% nonMSW		
	DEP Regional Boundary		Solid Waste Facility located in this town receives municipal solid waste EXCLUSIVELY from this town
	Community Boundary		Solid Waste Facility located in this town receives non-municipal solid waste EXCLUSIVELY from this town

NOTE: There are many more active Landfills than Combustion Facilities, however the total amount of waste handled at LFs

